City of Santa Barbara
Fire Department

Wildland Fire Plan

Prepared by: City of Santa Barbara
Fire Department
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Executive Summary

The City of Santa Barbara, Fire Department (SBFD) is proposing to implement a comprehensive, coordinated City Wildland Fire Plan (referred to as the "Plan") to protect lives, property, and natural resources threatened by wildland fire.

The City of Santa Barbara General Plan- Seismic – Safety Element adopted by the City Council in 1979, directed periodic review and revision of the Safety Element and is amended within the City's Fire Master Plan. The Plan updates the City's Fire Master Plan. The Fire Chief is mandated and has the authority to identify and amend areas within the City jurisdiction that are vulnerable to wildfire and to apply appropriate codes and strategies within these areas to protect life, property, and natural resources. This Plan identifies high fire hazard areas and develops policies and actions focused on reducing the impact of wildfire in our community.

To develop appropriate policies and actions the SBFD completed a wildland fire hazard and risk assessment of the City and the surrounding jurisdictions and combined hazard and risk with the values threatened by wildland fire.

The hazard assessment classified topography, weather, and fuels (vegetation). The interaction of these three variables influence fire behavior and severity. By combining these variables an overall hazard ranking was determined. These rankings were used to redefine the City's high fire hazard area and designate hazard zones within the high fire hazard area based on the degree of hazard. The risk assessment looked at factors that had the potential to increase the loss of life, property, and natural resources. Six factors were evaluated; roof type, proximity of structures to other structures, road systems, water supply, fire response times, and historic fire starts. Risk was overlaid onto the results of the hazard assessment. The SBFD then looked at the values within the City that were threatened by wildfire. These values, along with hazard and risk were used to develop polices and actions for the Plan.

The policies and actions developed for the Plan cover a wide range of areas. They include re-designation of the City's high fire hazard area, public education programs, evacuation preplanning, changes to City codes, fire protection services, biomass utilization, and vegetation management programs on both private and public lands. Following are the major polices and actions that make up the Wildland Fire Plan.

High Fire Hazard Defensible Space Requirements

The Plan proposes to redefine the City's existing high fire hazard area based on fire hazard, classify the high fire hazard area into high fire hazard four zones, and to apply appropriate vegetation management distances to each zone (Table 1).

Table 1 - High Fire Hazard Defensible Space Requirements for High Fire Hazard Zone

High Fire Hazard Zone	Defensible Space Requirement
Coastal Interior Zone	30 to 50 feet defensible space*
Coastal Zone	50 to 70 feet defensible space*
Foothill Zone	100 feet defensible space*
Extreme Foothill Zone	150 feet defensible space*

**** Note** Within any high fire hazard zone, additional defensible space may be required on slopes greater than 30%. Slopes ranging between 30 to 40% may require 200 feet defensible space. Slopes ranging from 41 to 60% may require 250 to 300 foot defensible space.

Vegetation Management Units on Private Lands

The Wildland Fire Plan identified areas within the high fire hazard area that are outside the Fire Department Defensible Space Requirements, but that have existing hazards and risks that increase the potential for loss of wildlife habitat, property loss and safe fire protection. These units are identified as Vegetation Management Units. Vegetation management is proposed within each of these units and will require the Fire Department working with private property owners and neighborhoods to implement.

The projects within each vegetation management unit will involve reducing the amount of flammable vegetation within the area by approximately 1/3 to 1/2. Vegetation management will be targeted on the removal of flammable vegetation (brush and under story) by preferentially removing exotic plants, thinning, pruning and limbing of vegetation to remove fire ladders, limbing up of oak over story, pruning out of dead material, and thinning out continuous areas of brush using a mosaic pattern. Eucalyptus trees may be thinned to obtain 6 to 12 trees per 1,000 square feet.

Vegetation management would be accomplished using one or more approved methods of vegetation management, dependent on slopes, exposures, vegetation types, and access. The four methods proposed to be used are hand cutting and chipping vegetation, hand cutting and multi-cutting vegetation, hand cutting and prescribed burning of vegetation.

Table 2 outlines specific vegetation management methods that will be used in each vegetation management unit.

Table 2

Vegetation Management Unit	Proposed Vegetation Management Method				
	Hand Cutting & Chipping	Hand Cutting & Multi-cutting	Hand Cutting & Prescribed Burning	Prescribed Burning	Combination of Methods
Las Canoas Road	**x**	**x**	**x**	**x**	**x**
Upper Coyote Road	**x**	**x**	**x**	**x**	**x**
Circle Drive/Las Barrancas	**x**	**x**	**x**		**x**
Coyote Road	**x**	**x**	**x**		**x**
Coyote Circle	**x**	**x**	**x**		**x**
Conejo Road	**x**	**x**	**x**		**x**
Fire Station 7	**x**	**x**	**x**	**x**	**x**
San Roque Creek	**x**	**x**	**x**		**x**
Hillcrest Road	**x**	**x**			**x**
Eucalyptus Hills Road	**x**	**x**			**x**
Alston Place	**x**	**x**			**x**
Owens Road	**x**				
Cleveland School area	**x**				
Jimeno/Garcia Road	**x**	**x**			**x**
Stevens Park area	**x**	**x**	**x**	**x**	**x**
Mountain/Las Tunas	**x**				
Camino Viejo	**x**	**x**			**x**
Cima Linda	**x**	**x**			**x**
Alturas Del Sol	**x**	**x**			**x**
Garcia/Ferrello Canyon	**x**	**x**			**x**
Honda Valley	**x**				
Las Positas Road	**x**				
Flora Vista	**x**				

Vegetation Management on City Lands

The City recognizes the importance of reducing fire hazard on City lands. A Vegetative Fuels Management Plan was completed in 1993 to identify and recommend vegetation management projects on City lands, both in and outside the City's high fire hazard area. The Wildland Fire Plan will incorporate the 1993 Vegetative Fuels Management Plan recommendations and update recommendations based on the SBFD hazard and risk assessment.

Vegetation management identified in this Plan will involve reducing the amount of flammable vegetation within identified City lands by 1/3 to ½. Vegetation management will be targeted on the removal of flammable vegetation (brush and under story) by preferentially removing exotic plants, thinning, pruning and limbing of vegetation to remove fire ladders, limbing up of oak over story, pruning out of dead material, and thinning out continuous areas of brush using a mosaic pattern. Eucalyptus trees may be thinned to obtain 6 to 12 trees per 1,000 square feet.

Vegetation management would be accomplished using one or more approved methods of vegetation management, dependent on slopes, exposures, vegetation types, and access. The four methods proposed to be used are hand cutting and chipping vegetation, hand cutting and multi-cutting vegetation, hand cutting and prescribe burning vegetation, and prescribe burning vegetation.

Community Fuels Treatment Network

The Plan proposes to create a community fuels treatment network within the Extreme Foothill Zone to provide a break between continuous decadent stands of chaparral fuel outside the City boundary and the City area. This provides a strategic last line of defense for fire protection resources to suppress a wildland fire before it enters more highly populated areas of the City. A community fuels treatment network is an area where multiple property owners interlink their individual defensible space areas and treat continuous strips of hazardous vegetation to form a vegetation management network.

The project would involve reducing the amount of flammable vegetation within the community fuels treatment network and outside the property owners Defensible Space requirements by approximately 1/3 to 2/3. The focus of vegetation management will be vegetation outside the Fire Department's 150-foot modification requirements from all structures within the Extreme Foothill Zone (Defensible Space Requirements). Vegetation management will be targeted on the removal of flammable vegetation (brush and understory) by preferentially removing exotic plants, thinning, pruning and limbing of vegetation to remove fire ladders, limbing up of oak overstory, pruning out of dead material, and thinning out continuous areas of brush using a mosaic pattern. Eucalyptus trees may be thinned to obtain 6 to 12 trees per 1,000 square feet.

Vegetation management would be accomplished using one or more approved methods of vegetation management, dependent on slopes, exposures, vegetation types, and access. The three methods proposed to be used are hand cutting and chipping vegetation, hand cutting and multi-cutting vegetation, and hand cutting and prescribe burning vegetation.

Biomass Utilization

Vegetation management projects proposed by the Plan will result in an increase in the amount of biomass generated within the City. Biomass (chips) that cannot be spread back into project areas must be hauled to the landfill or other sites if available. The Plan proposes to complete a feasibility study to look at creating economic alternatives and incentives for local businesses to utilize this biomass.

Invasive Exotic Plant Management

A main focus of proposed vegetation management project is the removal of exotic pest plants. The Plan proposes to develop standards for the eradication of exotic invasive plants and to prevent the introduction of these plants into project areas where vegetation has been removed. The standards will include the most current strategies for eradication of exotic invasive plants that may include the use of herbicides.

Evacuation Planning

Evacuation from a wildfire is the first and most important step the public can take in protecting themselves and their family. Evacuation during a wildland fire is the primary responsibility of the Police Department and cooperating law enforcement agencies. The Plan includes the City identifying specific roads that do not meet Fire Department Access Standards and developing appropriate tools (exp. a tool box of measures) that can be used to reduce fire risk in these areas. In addition, the Plan includes the City continuing vegetation road clearance along identified roadways for fire department response and public evacuation within the high fire hazard area. Vegetation road clearance involves thinning, cutting, and pruning flammable vegetation for a distance of 10 feet from the road edge and a vertical distance of 13 feet 6 inches within the drivable roadway.

Codes and Standards

Codes and standards are proposed to support polices and actions developed for the Plan and are outlined within the Plan.

Public Education

The Plan recognizes the importance of public education programs. A large part of the Plan proposes to increase the community's knowledge and awareness of wildland fire and develop training and education programs that prepare, motivate, and educate the public.

Chapter 1- Introduction

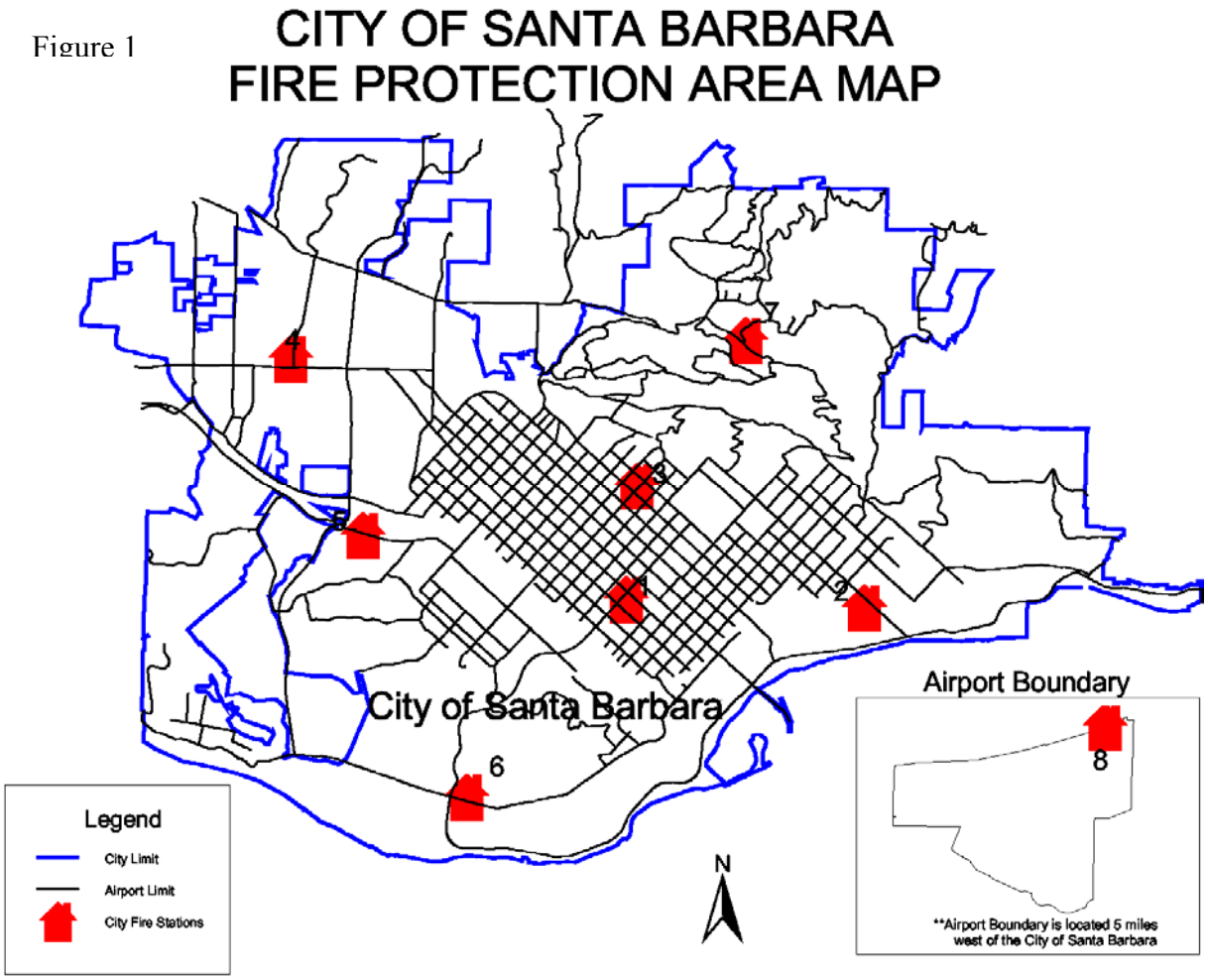
1.0 Background

The City of Santa Barbara is an incorporated city located between the coastal Santa Ynez Mountains and the Pacific Ocean, approximately 100 miles northwest of Los Angeles. Santa Barbara is a unique area known for it's Mediterranean climate, natural beauty, and rich history. The natural diversity of the area provides many unique opportunities for the residents who live here and tourists who visit our area.

1.0.1 Fire Protection

The Santa Barbara City Fire Department provides a full range of fire protection services to the community. Services include emergency medical response, structural firefighting, hazardous material response, wildland fire response, harbor and aircraft rescue firefighting. The department supports the community through training, preplanning, public education, fire prevention, and mitigation for the variety of emergency services. See Figure 1, City of Santa Barbara - Fire Protection Area Map.

Figure 1



To date, the largest dollar loss incidents to the City have been from wildland fires. The Fire Department has been actively working on reducing the impact of wildland fire in our community since its inception. However, the focus has shifted from primarily suppression and prevention of wildland fires, to include a greater emphasis on the mitigation of the hazards and risk that make us vulnerable to wildland fire. Since the 1977 Sycamore Canyon Fire, the City has implemented many wildland fire prevention and mitigation measures. Despite these efforts, our community is still vulnerable to catastrophic loss that results from wildland fire.

The Santa Ynez Mountain range dominates our area. This range is an east – west traversing mountain range that makes our area prone to local Santa Ana and Sundowner wind conditions. Terrain is steep, rocky and is covered with chaparral vegetation that is highly flammable and designed to burn. Landscape vegetation also covers much of this area. Intermixed or interfaced with this terrain are high value residential structures that make up the City's urban wildland interface.

Urban Wildland Interface

Wildland fire has always been part of the Santa Barbara community. The chaparral environment has adapted over millions of years with fire as a natural part of its ecosystem. Current and past fire exclusion and suppression policies have resulted in large accumulations of vegetation on hillsides both within and above City. When these hillsides do burn, they burn under unnatural conditions. As vegetative growth and development continues in our urban wildland interface, there is an increased potential for loss of life, structures and resources, both natural and economic.

Fire history in the Santa Barbara front country (from Gaviota Pass to the Santa Barbara/Ventura County line and north to the Camino Cielo Ridge) shows a major wildland fire occurring in our area on average every ten years (*See Figure 2*). Some of the most recent large wildfires include: The 1964 Coyote Fire that burned 67,000 acres, destroyed 106 homes, and resulted in 1 death; the 1971 Romero Canyon Fire that burned 14,500 acres, destroyed 4 homes, and resulted in 4 deaths; the 1977 Sycamore Canyon Fire that burned 805 acres, destroyed 195 homes, with a property loss of 26 million dollars; and the 1990 Painted Cave Fire that burned 4,900 acres, destroyed 479 homes, with a property loss of 290 million dollars, and resulted in 1 death.

1.1 Purpose of the Plan

Because of the potential for significant loss to life, property, and natural resources from wildland fire, the City has placed a high priority on developing a comprehensive wildland fire program.

The City of Santa Barbara General Plan-Seismic Safety-Safety Element, adopted by City Council in 1979, directed periodic review and revision of the Safety Element and is amended within the City's Fire Master Plan. An update of the City Master Fire Plan was completed in 1986. After the 1990 Painted Cave Fire, the Fire Department recognized the 1986 Fire Master Plan did not fully develop recommendations to adequately address the City's vulnerability to wildland fire.

In 1992/93 the City completed a Wildland (Vegetation) Fuels Management Plan on City owned lands. The plan identified vegetation management projects on 1,600 acres of undeveloped City park and open space lands. The plan was adopted by the City Council in 1993 and was implemented by the Parks and Water Resource Departments. Maintenance continues under this plan. However, this plan only addressed City lands.

In 1993, a City Wildland Interface Specialist was hired to update the Fire Master Plan and provide expertise and direction in developing a comprehensive wildland fire program. In 2000/2001 a hazard and risk assessment was completed to accurately portray existing conditions within the City and the surrounding area. The results of the assessment were compiled and policies and actions were then developed into a City Wildland Fire Plan.

The purpose of this Plan is to update the City Fire Master Plan and create a comprehensive, coordinated plan to mitigate the impact of wildland fire. This Plan will rank the City's existing high fire hazard areas based on hazard and risk, identify policies and actions to reduce the community's threat from wildland fire, and provide a process to better prioritize and fund implementation of wildland fire projects. Users of the plan include the Fire Department, all City Departments, City Boards and Commissions, City Council, and members of the public. The policies and actions outlined in Chapter 4 are a combination of policies and actions the City has already implemented and what is proposed to be implemented.

1.2 Stakeholders

The City recognizes that implementation of the Wildland Fire Plan is not possible without the support of the people, businesses, and organizations that live and work in our high fire hazard areas, as well as the many State, Federal, and local agencies that have jurisdiction in these areas.

These are the stakeholders that are impacted by this plan and must share in . the responsibility for protecting themselves and their community.

The role of the Fire Department is to identify wildland fire hazards and risks, develop recommended procedures and programs for City and private lands to minimize the threat of wildfire, educate the public on how to prepare and protect themselves from wildfire, enforce existing and new wildland fire codes to protect the public, and develop partnerships and cooperation from the City, homeowner groups, and individual property owners to effectively manage and respond to wildfire threat.

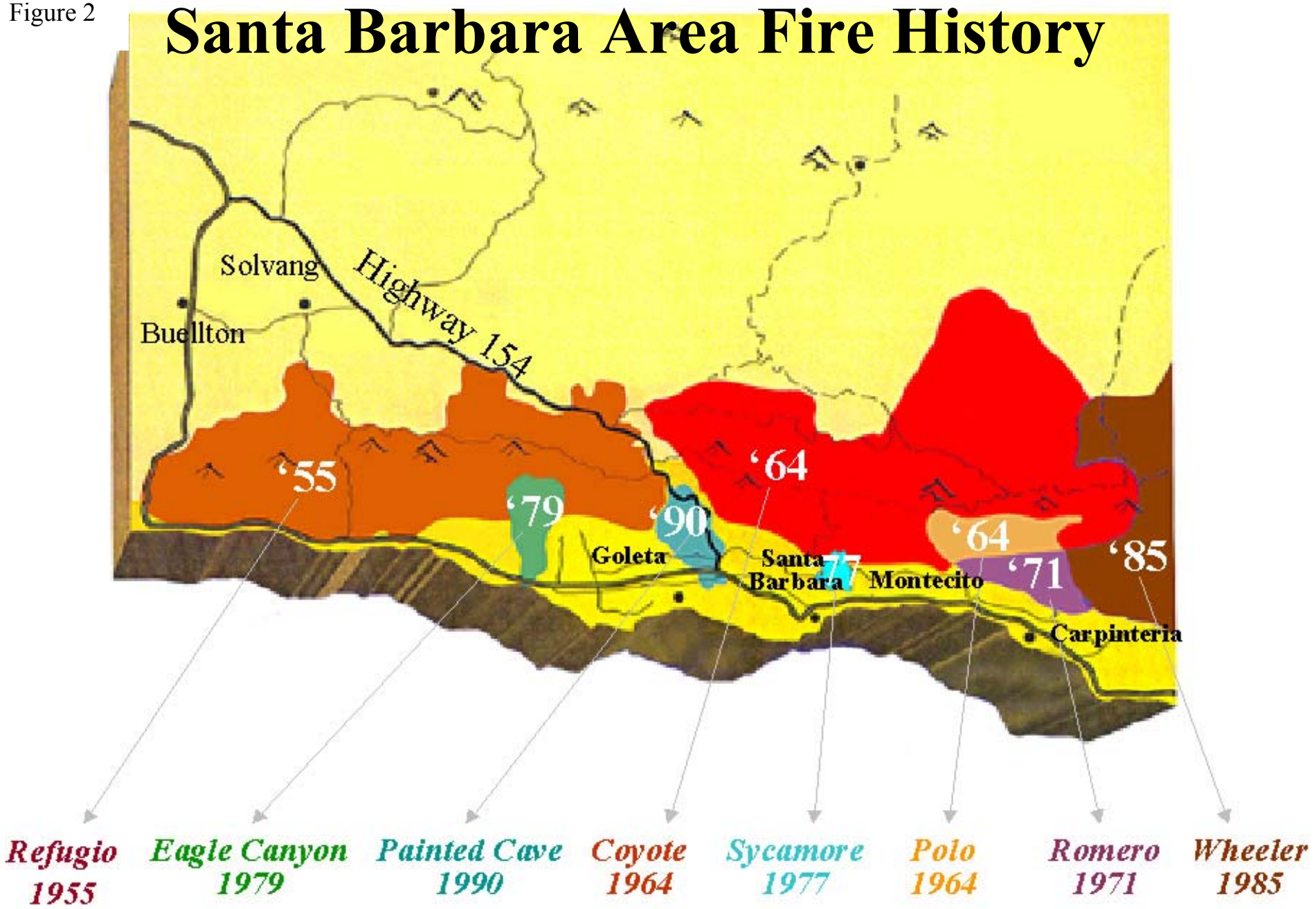
The role of stakeholders is to be aware of the hazards and risks that threaten their property and safety, comply with wildland fire codes, formulate wildland fire evacuation plans, support neighborhood preparedness and community groups focused on wildland fire safety, and become part of the solution in mitigating the wildfire threat.

Over the past 7 years the public living in the high fire hazard area have gained a greater understanding of the need to decrease the impact of wildfire and their personal responsibility in making that happen. We have seen a significant increase in public participation in wildland fire issues, such as involvement in regional task forces focused on wildland fire mitigation and evacuation, and public lobbying within city government to mitigate wildfire. There has also been an increase in the involvement and support from homeowner associations to complete cooperative fuel hazard reduction projects and to be involved in organizations, such as the Santa Barbara Fire Safe Council, that support these mitigation projects.

The Fire Department has also been working cooperatively with businesses and organizations in the high fire hazard area to better plan, prepare, and reduce the potential hazards and risks associated with wildland fire.

Federal, State, and local fire agencies have been working cooperatively to develop wildland fire plans and projects using a collaborative approach. The City will continue these collaborative efforts

Figure 2


Santa Barbara Area Fire History
Solvang
Buellton
Highway 154
'55
'79
'90
'64
'64
'71
'85
Goleta
Santa Barbara
Montecito
Carpinteria
Refugio 1955
Eagle Canyon 1979
Painted Cave 1990
Coyote 1964
Sycamore 1977
Polo 1964
Romero 1971
Wheeler 1985

Chapter 2 – Fire Hazard and Risk Assessment

2.0 Methodology

An assessment of existing hazards and risks was completed in 2000/2001 to determine the City's vulnerability to wildland fire.

The hazard and risk assessment was developed using geographic information system (GIS) technology. Existing analog maps and digital data were used to evaluate and rank hazard and risk. Aerial photos and field visits were then used to verify maps and digital data.

The hazard assessment was used to identify high fire hazard areas and develop fire hazard zones. The hazard and risk assessments combined were used to determine fire hazard zones within the high fire hazard area.

Goals, policies, and actions were then developed for each fire hazard zone.

- **Step 1 – Hazard Assessment**

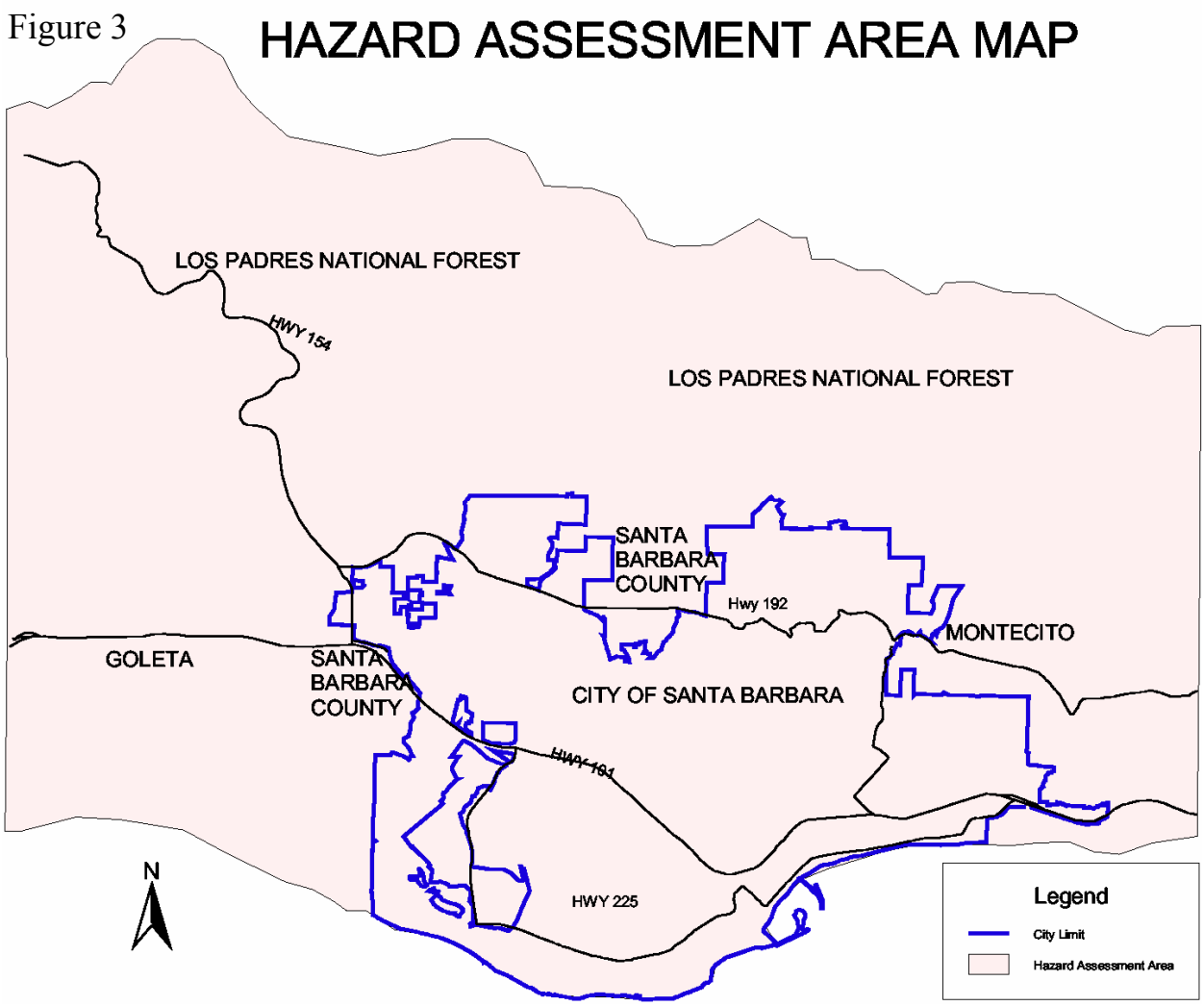
  Fire hazard classifications were determined by three variables; vegetation (fuel), topography, and weather. The interaction of these variables influence fire behavior and severity.

  Each variable was rated, then combined to determine an overall hazard classification (extreme, high, moderate, and low).

  The geographic area of the hazard assessment included the City of Santa Barbara, Santa Barbara County, Montecito and National Forest Lands. (See *Figure 3).*

  The results of the hazard assessment classification were used to determine the boundaries of the high fire hazard area. Areas with a hazard classification of extreme or high were identified as high fire hazard area. Areas with a hazard ranking of moderate or low were identified as non-high fire hazard areas.

Figure 3



Step 2 – Risk Assessment

Risk is defined by factors that have the potential to increase the loss of life, property, natural resources, and infrastructure during a wildfire. Six factors were evaluated; roof type, proximity of structures, road systems, water supply, fire response times, and historic fire starts.

Risk factors overlaid onto to hazard layers were used to determine fire hazard zones within the high fire hazard area. Fire hazard zones were developed to apply appropriate policies and actions to areas based on hazard and risk.

Because the priority of the wildland fire plan is to focus on high fire hazard areas, data for non-high fire hazard areas was not collected.

Risk factors were overlaid onto the hazard maps within the high fire hazard area. The result was the development of 4 fire hazard zones; 1) Extreme Foothill, 2) Foothill Zone, 3) Coastal Zone, and 4) Coastal Interior. (See Section 2.5 for a description of hazards and risks for each fire hazard zone.)

- **Step 3 - Values Threatened by Wildland Fire**

  Values threatened by wildfire are life, property, natural and economic resources. These values were identified using the City of Santa Barbara Digital Map Layers and Master Environmental Assessment Maps. Values threatened were used in developing goals, policies, and actions.

- **Step 4 - Designation of Vegetation Management Units within each High Fire Hazard Zone.**

  Within each fire hazard zone, areas were identified where existing hazards and risks did not fit the entire zone, but increased the potential loss to the identified values threatened. These areas were identified as Vegetation Management Units. Each unit will have different actions applied to protect the values threatened. Section 2.6 outlines each Vegetation Management Unit.

- **Step 5 - Fire Protection Services**

  Fire protection services for the community was then outlined in Chapter 3, Fire Protection Services. Fire behavior modeling was completed for each fire hard zone to better apply policies and actions based on a fires predicted rate of spread, its intensity, and the Fire Departments ability for fire suppression resources to control a fire. Fire protection services were used to develop goals, policies, and actions for the plan.

- **Step 6 - Evacuation Procedures**

  Evacuation preplanning procedures were developed based on work completed by an interagency County wide task force focused on wildland fire evacuation. Chapter 5 outlines the wildland fire evacuation procedures developed for the City.

- **Step 7 - Development of Draft Wildland Fire Plan Policies and Actions.**

  The steps outlined above went into the development of the goals, policies, and actions that make up the Proposed Wildland Fire Plan and are outlined in Chapter 4, Goals, Policies, and Actions. The plan proposes fuel management projects and biomass utilization, fire safe landscape requirements, changes to fire and building codes, fire protection measures, development of pre-fire staging and safety zones, community involvement, public education programs, and ways to develop funding sources.

  The Proposed Wildland Fire Plan was reviewed by City staff from various departments and divisions including Fire (Prevention, Operations, and Administration), Parks and Recreation (including Creeks), Police, Community Development (Planning), Public Works (Transportation and Water Resources) and the City Attorney. Changes to the plan were made and the plan has been submitted to City of Santa Barbara Planning staff for project review through the land development team process.

- **Step 8 – Environmental, Public Review, and Adoption of the Wildland Fire Plan**

  The Proposed Wildland Fire Plan will go through CEQA environmental review. Because the plan affects the City as a whole a programmatic environmental document may be required. Fire Staff will define the project description. The initial study for the plan will determine the level of CEQA environmental review, public review, and the legal timeframes and requirements for completion of the CEQA document. The final Wildland Fire Plan will be will be presented to the City Council for adoption.

2.1 Hazard Assessment

Wildfire hazard is defined using three factors that influence wildland fire behavior; fuel (vegetation), topography, and weather. Two variables of topography; slope and aspect, were used to identify existing topographic features. Fuel (vegetation) was identified using the California Department of Forestry and Fire Protection Fuels Maps that were developed for the Santa Barbara area. Weather variables are an important factor in ranking hazard and provide the greatest amount of uncertainty as to what may occur. Detailed historic fire weather data could not be obtained for the City area. From reviewing historical fire records in our area we know the most destructive fires have occurred under a Santa Ana or Sundowner wind condition. These types of down canyon wind conditions create extremely low humidity and vegetation moisture, exceptionally high temperatures and wind speeds in excess of 30 miles per hour resulting extreme fire behavior conditions. They are strongest in the foothill areas and in canyons aligned in a north/south direction. Using this information, areas where these historic wind patterns occur were determined by looking at slope and aspect features. See Appendix A for slope, aspect, and fuels maps, and additional information on the hazard assessment process.

Computer modeling (Geographic Information Systems) was then used to compile topography (slope and aspect), fuel, and weather (wind patterns) and produce an overall classification of hazard within the City and the surrounding area. Four classifications were identified as a result of the hazard assessment. They are extreme, high, moderate, and low (See Figure 4).

The hazard classification was used to determine City high fire hazard areas and non-high fire hazard areas. Areas classified as extreme and high were designated as high fire hazard area. Areas classified as moderate and low were designated as non-high fire hazard area (See Figure 5).

2.2 Risk Assessment

Risk is defined as factors having the potential to increase the loss of life, property, natural resources, and infrastructure during a wildfire. Six factors were evaluated; roof types, the proximity of homes, road systems, water availability, fire response times, and fire ignition patterns. Each factor is defined below.

Risk factors were developed for the high fire hazard area only. These factors were used to develop fire hazard zones within the high fire hazard area.

Risk factors were overlaid onto the hazard assessment and resulted in the development of 4 fire hazard zones; 1) Extreme Foothill, 2) Foothill Zone, 3) Coastal Zone, and 4) Coastal Interior.

See Section 2.5 for a description of hazards for each fire hazard zone. Risk factors for each fire hazard zone are outlined in Tables 2, 3, 4, and 5 at the end of this chapter.

The first five risk factors take into account the concept of defensible space. Defensible space is the area around a parcel, development, neighborhood, or community where basic fire protection practices provide a key area of defense for fire fighters to safely protect a structure from an approaching wildfire or help contain a fire burning in a structure from spreading to surrounding exposures. The area is characterized by the establishment and maintenance of non-combustible building construction, proximity of structures, road access that affects emergency response, response times, evacuation, street names and addressing, and water supply.[1] Without defensible space the potential risk for loss of life, property, natural resources, and infrastructure is increased.

Roof Type (See Figure 6)

One of the critical factors in whether a home survives or is destroyed by wildfire is whether the home is constructed with non-combustible roofing material. The roof of a structure is perhaps the most susceptible to ignition from a wildfire. The primary means of roof ignition is due to burning embers deposited on roof tops during a wildfire. Burning embers are produced during a wildfire from burning vegetation, structures, and other flammable materials and are carried by the wind. These burning brands can be carried up to a mile or more ahead of a fire.[2] Roofs may also be ignited by direct flames from burning trees and shrubs surrounding a structure.[3] Once the roof structure is ignited, fire quickly spreads through the whole structure. Non-combustible roofing material greatly increases the chances of structure survival in a wildfire.

After the 1977 Sycamore Canyon Fire the City building code required all roof coverings on new, existing, or additions within the high fire hazard area to be class A, non-combustible materials (City Municipal Code, Ordinance 5104, Chapter 37, Section 3703). However, many homes built prior to 1977 still have combustible roofing material.

Other construction features, such as over hanging porches, combustible siding, window openings, and eave configurations can contribute to the vulnerability of structures during a wildfire. These construction features were not surveyed in the assessment due to the amount of resources required to collect this information.

Because roof type is considered a critical factor in the ability of a structure to survive a wildfire, all structures within the high fire hazard area were surveyed and mapped. Two roof categories were surveyed: non-combustible (included tile, asphalt, and cement shingle roofs) and combustible (wood shake or shingle roofs).

2.2.2 Proximity Of Structures (See Figure 7)

Areas within close proximity of other structures are at greater risk of burning due to the radiant heat generated from a burning structure transferring to another within close proximity. The effect of radiant heat during wind driven fires has been well documented.[4] Wind and slope can significantly increase the radiant heat exposure to surrounding structures. The type of building

construction and the amount and kind of vegetation between structures also play a role in the ability of a structure to withstand radiant heat exposure.

The proximity of structures limits the ability of homeowners to maintain a minimum of 30 feet defensible space between structures. The lack of defensible space inhibits firefighters from being able to safely maneuver around structures to provide protection.

The City's Assessor Parcel Database was used to determine the proximity of structures to other structures by evaluating parcel acreage. Parcels were divided into low (parcels greater than 1 acre), moderate (parcels between ½ and 1 acre) and high (parcels less than ½ acre). Parcels with lower acreage have a closer proximity to other structures and have a greater risk of burning due to higher exposure to radiant heat than parcels with higher acreage that have more distance between structures.

2.2.3 Road Systems - includes roads, driveways and addressing - (See Figure 8)

Road systems (includes both roads and driveways) affect the timing of emergency response, the safety of emergency responders, and the ability to safely evacuate the public during a wildfire. During the 1991 Oakland Hills Fire 25 people died along roadways while trying to flee the fire.[5] Oakland attributed a number of these deaths to narrow road widths and circulation. Additionally, steep winding roads, lack of vegetation clearance, bridges, obstructions, panic by the public evacuating the area, as well as fast moving fire spread all contribute to the problem and the potential for loss of life.

The current Fire Department Access Standards (City Municipal Code, Ordinance 5100, Section 902) for new development adequately address fire access in the high fire hazard area. These access standards address;

- -Road width (20 foot unobstructed road width)
- -Vertical road clearance (not less than 13 feet 6 inches)
- -Type of road surface (surface must be capable of supporting 60,000 pounds
- -Turning radius (not less than 70 feet in diameter from outer edge to outer edge)
- -Dead ends (roads in excess of 300 feet must provide approved provisions for turning around of fire apparatus)
- -Bridges (designed to provide support a 60,000 pound fire apparatus)
- -Grade (not to exceed 16% slope or a cross slope gradient of 5%)
- -Addressing requirements (3 ½ inch high numbers plainly visible from street or road affronting property)

However, a fair portion of the City's foothill high fire hazard area was built prior to current access standards and a number of areas have roads that are considered existing-non conforming. In addition, roads that meet current standards or are existing non-conforming are further narrowed by on street parking and vegetation encroachment. These road area further reduce the Fire Department's required 20 foot unobstructed road width. These roads pose a higher risk to fire personnel and the public evacuating from a wildfire.

Driveways that do not meet current fire access standards can pose a significant risk to firefighters responding to wildland fires. Existing non-conforming drives within the high fire hazard areas do not allow fire engines to safely turn around which can result in fire fighters becoming entrapped.

Addressing is part of the Fire Department's access standards. Like roads and driveway standards, newer developments meet the Fire Departments standards, however, older developments may not be adequately addressed so that firefighters can easily locate residents.

During a wildfire the Fire Department must rely heavily on cooperating agencies resources from throughout the state. These resources may be unfamiliar with our local area and must rely on property owners to clearly identify their property and any potential hazards. Areas that have existing non-conforming standards are at increased risk from wildfires.

Wildland fire risk within the high fire hazard area related to road systems are identified in Tables 2 – 5 on pages 40 – 43.

The City of Santa Barbara Centerline file, Santa Barbara Flood Digital Map layer, Fire Department Map Book, field observations, and engine company response was used to evaluate road systems.

2.2.4 Water Supply (See Figure 9)

Water systems that supply adequate quantity, pressure, and duration are essential to fire fighting efforts and structure protection.[6] Without adequate water supply the ability to safely protect structures and suppress outside exposures that threaten structures are compromised.

The Fire Department Water Supply and Fire Hydrant standards (City Municipal Code, Ordinance 5100, Section 903) outline the City's water supply requirements (included in Appendix B). The fire report conducted after the 1977 Sycamore Canyon Fire, identified the inability for water supply systems to provide adequate pressure and volume as a contributing factor in the high loss of structures. Since the Sycamore Canyon Fire, the Public Works Department has developed an extensive water distribution system that consists of many components including reservoirs, pump stations, water mains, and fire hydrants. Fire hydrants (with fire flow ratings) and water reservoirs important for fire suppression were identified using the Public Works, Water Resource Department maps.

2.2.5 Fire Response Time (See Figure 10)

Fire response time was used to determine the increased risk of a large fire occurring. During periods of high fire danger weather (low relative humidity's, high winds, low fuel moisture, and high temperatures) the potential for large fires increases. Extended fire response times increase the potential for a fire to escape initial control efforts and increase the risk to the surrounding area.

Fire response time was evaluated using the Fire Department's 4-minute response standard. The Fire Department fire response maps were used to evaluate the City's response areas. Areas outside the 4-minute response time have a greater potential of a large fire becoming established during periods of high fire danger weather and are considered high risk areas.

2.2.6 Fire Starts (Ignitions) (See Figure 11)

Data about the historic cause of fire starts (ignitions) was used to identify any potential fire start patterns and to determine large scale fire potential. Fire starts were identified for a five-year period starting in October 1995 to October 2000, using Fire Department response records for brush and vegetation fires within the entire City area (excluding the airport property). Large fire potential is based on a combination of both fire starts and fire response times. During periods of high fire danger weather, the potential for large fires increases as response times to suppress a fire increase.

Historic brush fire ignitions within the high fire hazard area did not give solid data on fire ignition patterns and it is recommended data be further developed using all fire start data, such as structure and vehicle fires. However, three areas did stand out. Fire ignition patterns focused primarily around schools, Highway 101, and the railroad tracks. These ignition points were located outside the high fire hazard area and will not specifically be included as part of this plan, but help inform the plan analysis. Further development of the brush fire ignitions will help to analyze better fire prevention actions within the high fire hazard area since any fire (structure fire, vehicle fire, equipment, etc.) occurring during high fire danger weather poses a significant fire risk.

2.3 Values Threatened by Wildland Fire

Values threatened are life, property, and natural and economic resources that can be at risk in the event of a wildfire.

The Fire Department's Mission Statement is to protect life and property, control and extinguish fires, effect rescue, contain and control hazardous materials incidents, provide emergency medical assistance, and respond to other community-threatening emergencies as required. In addition, the Fire Department is committed to balancing and protecting the community's natural resources.

The lives and property threatened by wildfire are of paramount importance. However, natural resource and economic values threatened by wildfire are also significant and may often be overlooked. A major wildfire in our community would potentially result in the loss of biological, cultural, and visual resources. In addition, the potential economic loss from the drop in tourism and damage to City infrastructure could substantially impact the local economy.

Wildland fire has always been a part of our Mediterranean environment and is a natural process. What has changed is the potential for the loss of life, property and reduction in natural habitat from wildfires as we continue to develop into our urban wildland interface areas. From our fire history we have learned much about wildfire and we know we will continue to build into fire prone areas. As we continue development in these areas we must build in fire protection systems that allow for the survival of homes, the safety of firefighters and the public, as well as the protection of our natural resources.

2.3.1 Life

The potential for loss of life threatened by wildfire is difficult to calculate. The 1990 Painted Cave Fire resulted in the death of one resident. The 1977 Romero Fire resulted in the death of four firefighters. The 1991 Oakland Hills Fire is significant to the fire service because of the deaths of 25 people, both emergency responders and residents, while trying to evacuate from the fire. The conditions that exist in many areas in the City's high fire hazard zone are identical to conditions prior to the Oakland Hills Fire. As our population increases in our high fire hazard zones the potential for loss of life will increase without a comprehensive approach to the problems.

2.3.2 Property (See Figure 12)

Home values in the Santa Barbara area are some of the highest in the nation. The median sale price of a home within the South Coast area of Santa Barbara County is presently $650,000 (Century 21 Realtors, 2002). The median sale price of a home in the high fire hazard area is considerably higher. Table 1 lists the median sale price of a home and the approximate number of structures threatened within each high fire hazard zone. The 1977 Sycamore Canyon Fire destroyed 234 homes and resulted in $30 million in property loss. A fire of that size and intensity today would have an estimated property loss value of $260 million.

Table 1: Median Sale Price of Homes in the High Fire Hazard Area.

HIGH FIRE HAZARD ZONE	STRUCTURES THREATENED	MEDIAN SALE PRICE
Riviera area and above	2,961	$1,112, 500
Northridge/Santa Teresita area	574	$922,000
Eucalyptus Hill area	911	$1,112,500
Campanil Hill/Braemar Ranch/Vista Del Mar area	935	$1,349,378

2.3.3 Natural Resources

Natural resources include biological, cultural/historic, and visual resources, creeks, air quality, drainage, and flood control.

The Conservation Element of the City of Santa Barbara General Plan is designed to serve as a policy guide to preserve and enhance the natural resources in our community using a comprehensive long term and general approach.

A major focus of the Conservation Element is the potential for conflict between urban use and development and ecosystem preservation. Wildfire affects both of these issue areas and does not discriminate between natural ecosystems (habitats) or urban development, i.e. structures. To

reduce the catastrophic impacts to both urban development and ecosystems and allow for the preservation of natural resources, polices and actions must be developed that enhance ecosystems and reduce their vulnerability to wildfire.

Our chaparral environment has adapted over millions of years with fire as a natural part of its ecosystem. Current and past fire exclusion and suppression policies have resulted in the unnatural build up of flammable vegetation. When these areas burn under wildfire conditions, they result in intense fire behavior and increase the potential for resource damage.

The goal of the Wildland Fire Plan is to develop a comprehensive program that balances the goals, policies, and implementation strategies of the Conservation Element with the potential effects of wildland fire. A description of how fire affects each specific natural resource is included in this section.

Biological Resources (See Figure 13) - Biotic communities - There are many diverse biotic communities that make up the City's biological resources. They provide important biological habitats for plant and animal species. The vegetation that exists in these communities also becomes fuel available to burn during a wildland fire. The impact of a wildfire in many of these communities can be devastating, especially under Santa Ana or Sundowner wind conditions.

Rare, Endangered, and Threatened Plants and Animals - Because of the diversity of biotic communities in our area, many different rare, endangered, and threatened animal species exist. The protection of these plants and animals is required by law and is essential to biological diversity. Like biotic communities, these plants and animals are threatened by wildfire.

Cultural and Historic Resources - The City is committed to the conservation of its archeological and historic resources. The impact of a wildfire directly threatens these resources through heat from direct flame, soils erosion, and post fire flooding.

Visual Resources (See Figure 14) - The aesthetic qualities of the City vary as widely as the nature of the topography and land uses. The scenic mountains that provide the backdrop for our coastal community are also the natural features that create the wildland fire hazard (weather, topography, and fuel). A conflict in the mitigation of wildland fire is that the vegetation (fuel) also provides the scenic backdrop to our community. The preservation of scenic resources in the land development process attempts to soften the visual impact of development and potentially increases the fire hazard in our community.

Santa Barbara is also highly dependent on its visual resources to sustain the local economy. There is a high potential for a wildland conflagration disrupting our economic stability.

Creeks (See Figure 15) – The Santa Barbara area has significant riparian habitat and resources within our many creek areas. In recent years the City has placed a major emphasis on the restoration and protection of creek areas. A number of the main creeks are vulnerable to impacts if a wildfire burns in these areas.

Historic large fires within the Santa Barbara area have been wind driven fires. Because of the east/west alignment of the Santa Ynez mountain range winds are funneled down through major drainages. Some creek areas have heavy concentrations of flammable vegetation. A wildfire burning through these areas has the potential for significant loss of riparian habitat and water quality. In addition, erosion occurring on steeper slopes above drainages where soil conditions are susceptible to erosion or are accelerated from a wildfire will end up being deposited in creek areas where flow velocities are sufficiently reduced.

Air Quality - The California Air Resources Board (CARB) regulates the air quality within California. The Santa Barbara County Air Pollution Control District (APCD) is mandated to regulate local policies and actions that may affect the production of emissions within Santa Barbara County.

Wildland fire affects air quality by producing smoke emissions that may exceed CARB's standards for carbon monoxide, carbon dioxide, methane and non-methane hydrocarbons and particulate matter less than 10 and 2.5 microns in diameter. The amount of chemicals and particulate matter produced in a wildland fire is directly related to the amount of fuel consumed.

There are several variables that determine air quality impacts associated with wildfire. The location of the fire, wind direction and speed, age class and amount of fuel, duration and size of the fire determine air quality emissions. Measuring the emissions from the fire is determined by the location of the receptor in relation to the fire. For these reasons, determining emissions from prior wildfires is inaccurate. The Santa Barbara County APCD was contacted to determine if air quality monitoring data from 2003 wildfires or prescribed burns would provide information on the elevated levels of nitrogen oxides, carbon dioxides, and particulate matter. APCD staff was unable to provide such data due to local monitoring stations inability to measure air quality during a fire event because the fire occurred between sampling times, or fires were not located the monitoring station. Because these wildfires are uncontrolled there is no ability to regulate the amount or the duration of emissions into the atmosphere. However, it is clear that emissions from wildfires are substantial compared to prescribed fires or where wildfires burn in areas where vegetation management has been conducted (APCD, 2003).

Wildland fire mitigation involves many fuels management practices such as prescribed burning, cutting, chipping and mechanical methods. Prescribed burning, like wildfire, produces chemical and particulate matter that has the potential to exceed CARB standards. But unlike wildfire, prescribed burning can be mitigated through smoke management practices outlined by CARB and the Santa Barbara County APCD to avoid exceeding air quality standards. Other fuel management practices where vegetation is not burned, but cut, chipped or mechanically removed, do not exceed air quality standards and are considered a non-significant, short-term activity.

Drainage and Flood Control (See Figures 16 and 17) - Santa Barbara has a history of major flood events dating back to 1862. These major floods result from high-intensity rainfall, which produces heavy runoff in a shot period of time.
After a wildfire, the potential for soil erosion and catastrophic flooding is greatly increased. In the period following a fire and before the re-growth of vegetation, bare hills are vulnerable

to greatly accelerated erosion rates. This is because vegetation and ground cover are burned away, allowing the soil surface to become unstable and move down steep slopes, creating a dry erosion process known as "raveling". Without plant material on the soil surface, rain falling on these burned slopes washes additional soil material down slope. In addition, the development of a water repellent layer in the soil, created as a result of the fire's intensity, increases soil erosion by significantly reducing water infiltration. This accelerated slope runoff can move dry soil material that has accumulated at the base of slopes, creating flooding and debris flows.[7]

These conditions occurred after the 1990 Paint Fire, 1964 Coyote Fire, and the 1944 Polo Fire and resulted in additional property and soil loss.

2.3.4 Economics

The potential impact of wildfire on structure loss is significant. The 1990 Painted Cave Fire resulted in 524 homes being destroyed and a dollar loss of over 290 million. With the build up of fuels and new homes built in the high fire hazard area, a wildfire of that proportion would have similar results, and have a much greater dollar loss.

The local economy is heavily dependent on its natural resources. A significant amount of revenue is received from the tourist industry. There is a high potential for a wildland conflagration to disrupt both the quality of life and economic stability.

The potential for economic losses due to litigation resulting from wildfire damage is a reality. Litigation and decisions resulting from the 1990 Painted Cave Fire and the 1991 Oakland Hills Fire resulted in an economic effect on property management decisions. Damage claims against the property owners where the fire originated in and/or spread from or through their property, due to untreated wildland areas, represents potential economic loss to both the City and private property owners.[8]

2.4 Existing High Fire Hazard Area

After the 1979 Sycamore Canyon Fire, the City of Santa Barbara Fire Department identified areas within city limits vulnerable to wildland fire. These areas were identified based on slope and vegetation and were designated as high fire hazard areas. Municipal codes and ordinances to impose fire and safety requirements in these areas were adopted (City Municipal Ordinance 5100). In 1992, after the Oakland Hills Fire, California State Assembly Bill No. 337 (Bates Bill) was approved by the Governor. This bill required State Fire agencies to ensure that local fire agencies identified areas vulnerable to wildfire, have these areas designated as very high fire hazard severity zones, and allow local agencies to impose fire and safety requirements as authorized by law. The City Fire Department reviewed the 1979 existing high fire hazard areas and determined that our existing high fire hazard area met the intent of the Bates Bill very high fire hazard severity zones. (See Figure 18).

Since 1992, research, technology and an understanding of wildfire severity and it's impact on communities has changed significantly. In 1998, the Fire Department reviewed the existing high fire hazard area and felt that a hazard and risk assessment was needed to fully analyze the City's wildland fire threat. This Plan is the result of the hazard and risk assessment and redefines the

existing high fire hazard area (Figure 18).The new high fire hazard area is separated into 4 fire hazard zones (See Figure 19). Each fire zone is described below.

2.5 Fire Hazard Zones

The results of the hazard and risk assessment were used to determine fire hazard zones within the high fire hazard area. Four fire hazard zones were identified; 1) Extreme Foothill Zone, 2) Foothill Zone, 3) Coastal Zone, and 4) Coastal Interior Zone (See Figure 19, Fire Hazard Zones). The risk factors for each fire hazard zone are outlined in Tables 2, 3, 4, and 5 add the end of this chapter.

A physical location and description of each fire hazard zone is outlined below, along with a rating of the potential fire behavior that can be expected in this zone.

2.5.1 Extreme Foothill Zone - 771 acres (See Table 2)

The Extreme Foothill Zone is found along the northern boundary of the City where large expanses of heavy decadent fuels from National Forest Lands border the City. Areas include West Mountain Drive, upper Gibraltar Road, Parma Park and area north of the park, Coyote Road, upper San Roque Road, and upper Santa Teresita Drive.

This zone has the potential for extreme fire behavior. It is defined by areas that have a combination of heavy, decadent chaparral and oak forests, steep slopes greater than 30 percent, many slopes with south and southwest aspects; and drainages that are directly aligned to frequent severe, hot dry wind conditions. These combined hazards make this zone vulnerable to extreme fire behavior.

Risk factors in this zone are outlined in Table 2 at the end of this chapter.

This zone is strategically important to the Fire Department, since it is the last line of defense for fire protection resources to suppress a wildfire before it enters more highly populated areas of the City.

2.5.2 Foothill Zone 2,498 acres (See Table 3)

The Foothill Zone includes the northwest and northeast portions of the City's high fire hazard area. Neighborhoods include Cielito, Riviera, Lower Riviera, Eucalyptus Hill, Foothill, San Roque area north of Foothill Road, and the area surrounding Stevens Park.

The potential fire behavior in this zone is considered high to extreme depending on weather and fuel conditions. This zone is defined as areas within the City where a combination of flammable chaparral, oak forest, riparian vegetation, eucalyptus groves, and landscaped fuels intermix with residential areas to pose a significant fire threat. The eucalyptus groves within this area are extensive, dense, and have significant accumulations of dead fuel that threaten the areas surrounding them. Slopes range from between 20 to 40 percent, and many slopes have southeast, south, and southwest aspects. Canyons within this zone are directly aligned to severe, hot dry wind conditions.

Risk factors in this zone are outlined in Table 3 at the end of this chapter.

2.5.3 Coastal Zone 645 acres (See Table 4)

The Coastal Zone includes the Campanil Hill and Hidden Valley area and in addition, includes the area north of Hidden Valley which is included in the City of Santa Barbara Annexation Plan (See Figure 19).

The potential fire behavior in this zone is considered moderate to high depending on weather conditions. The majority of fuels are moderate and intermixed with residential areas; slopes range from 10 to 35 percent, and aspects in this zone vary. The ocean influence dominates this area for much of the year, however, there are a number of canyons directly aligned to periodic hot dry wind conditions that occur during our late summer and fall months. This zone has many pockets of moderate fuel made up of chaparral, and landscape vegetation. Isolated areas of heavy fuel consisting of eucalyptus and oak vegetation increase the hazard in specific areas within this zone.

Risk factors in this zone are outlined in Table 4 at the end of this chapter.

2.5.4 Coastal Interior Zone - 824 acres (See Table 5)

The Coastal Interior Zone includes the portions of the Alta Mesa, mountain areas of the Westside, portions of the East and West Mesa, and part of Las Positas Park. It also includes areas in the Bel Air Knolls neighborhood and the northern portion of Las Positas Park that have in past years not been included in the high fire hazard area (See Figure 19).

The potential fire behavior in this zone is considered moderate to low. It is defined as areas within the City where the majority of fuel is made up of diverse pockets of vegetation consisting of heavy chaparral, oak forests, coastal sage shrub, landscaped vegetation, agricultural lands, and eucalyptus groves. Slopes in this zone range from 10 to 35 percent and aspects vary considerably. The canyons in this area are dissected. They are not in direct alignment to receive hot dry winds, although these winds are funneled through many of these areas. For the majority of the year this area is greatly affected by the ocean influence, however, when late summer and fall Santa Ana or Sundowner winds surface the risk to this area is significantly increased.

Risk factors in this zone are outlined in Table 5 at the end of this chapter.

2.6 Vegetation Management Units (See Figure 20)

Within each fire hazard zone specific areas were identified that have unique hazards and risks that have high values threatened by wildfire, the potential for increased fire behavior, and pose a challenge for fire protection because of heavy, flammable vegetation, lack of access due to topography and roads, and/or firefighter exposure. These units were identified as Vegetation Management Units. Because each of these areas is unique, specific actions will be developed for each unit based on community involvement, the type of vegetation, risk factors, and available funding. Each unit would be considered a neighborhood or community project and will require a combination of actions to protect the values threatened and improve fire protection. Actions would involve public education, vegetation hazard reduction projects, and other methods to reduce fire hazard and risk. Goals, Policies, and Actions for each Vegetation Management Unit are outlined in Chapter 4. Vegetation Management Units are listed below in order of priority.

Two vegetation management units; Stevens Park and Honda Valley were identified in the 1993 City Vegetative Fuels Management Plan (*See Appendix C*), however, this plan covered only City property. To reduce the fire hazard in this area public education, vegetation hazard reduction, and other methods are also needed on private property. Therefore, these areas have been identified as vegetation management units.

2.6.1 Extreme Foothill Zone

2 Vegetation Management Units identified:

1. Las Canoas Road (53 acres)
2. Upper Coyote Road (21 acres)

2.6.2 Foothill Zone

18 Vegetation Management Units identified:

1. Westmont/Las Barrancas (47 acres)
2. Coyote Road (12 acres)
3. Coyote Circle (11 acres)
4. Conejo Road (86 acres)
5. Fire Station 7 (2 acres)
6. San Roque Creek (82 acres)
7. Hillcrest Road (67 acres)
8. Eucalyptus Hills Road (63 acres)
9. Alston Place (39 acres)
10. Owens Road (25 acres)
11. Cleveland School area (8 acres)
12. Jimeno/Garcia Road (64 acres)
13. Stevens Park area (15 acres)
14. Mountain/Las Tunas (43 acres)
15. Camino Viejo (24 acres)
16. Cima Linda (16 acres)
17. Alturas Del Sol (18 acres)
18. Garcia/Ferrello Canyon (6 acres)

2.6.3 Coastal Zone

No Vegetation Management Units identified.

2.6.4 Coastal Interior Zone

3 Vegetation Management Units identified:

1. Hondo Valley (83 acres)
2. Las Positas Road (126 acres)
3. Flora Vista (40 acres)
4. Loma Alta (42 acres)

2.7 Sphere of Influence

The City Fire Department recognizes that hazards exist within the sphere of influence surrounding the City. Four main areas are outlined in this section; Mission Canyon, area northwest of the City boundary to Highway 154 above Foothill Road, Las Positas Valley, and Hope Ranch.

The Mission Canyon and area to the northwest of the City above Foothill Road, like the City Extreme Foothill and Foothill Zones, have the highest potential for high to extreme fire behavior depending on weather and fuel conditions. These areas will have the greatest impact on fire spreading into the City. Mission Canyon because of the high density of homes, dense vegetation, and narrow, winding roads has the greatest number of risk factors. The area to the northwest of the City above Foothill Road has better road access and a reduced density of homes.

The Hope Ranch and Las Positas areas, like the City Coastal Zone has the potential for moderate to high fire behavior. Vegetation in these areas are a mixture of eucalyptus, oak woodland, grasslands. This Plan encourages the City to work cooperatively with surrounding jurisdictions to reduce the fire hazard. Figure 21 shows the sphere of influence surrounding the City

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[1] David Sapsis, "Fire Behavior Modeling.", California's I-Zone, (1996), 205
[2] Fred L. Fisher, "Building Standards," California's I-Zone, (1996), 125
[3] Fred L. Fisher, "Building Standards," California's I-Zone, (1996), 125
[4] Jack Cohen, "Structure Ignition Assessment Can Help Reduce Fire Damages in the Wildland Urban-Interface," Fire Management Notes, 57, No. 4 (1997), pp.19-23
[5] Jim Hunt, I-Zone Infrastructure, "California's I-Zone," (1996), 56-57
[6] Jim Hunt, "I-Zone Infrastructure," (1996), California's I-Zone, 59
[7] Jan Beyers, Peter Wohlgemuth, Carla D. Wakeman, and Susan G. Conard, "Does Ryegrass Seeding Control Post-fire Erosion in Chaparral", Fire Management Notes, Volume 58 No. 3 (1998), p. 30
[8] City of Santa Barbara, "Five Year Vegetative Fuels Management Plan, 1997, p. 13

Figure 4

HAZARD ASSESSMENT MAP

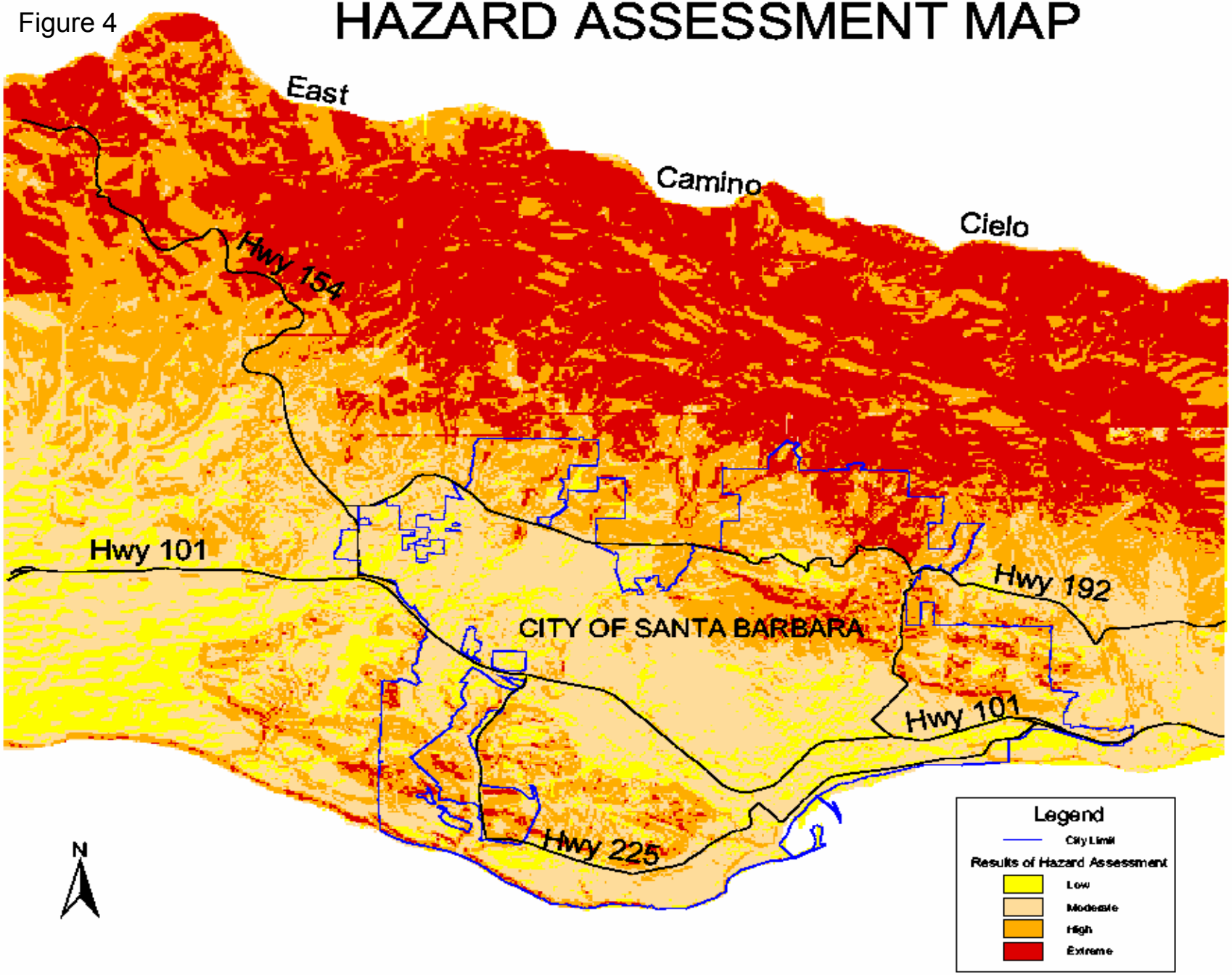


Figure 5

HIGH FIRE HAZARD AND NON-HIGH FIRE HAZARD AREA

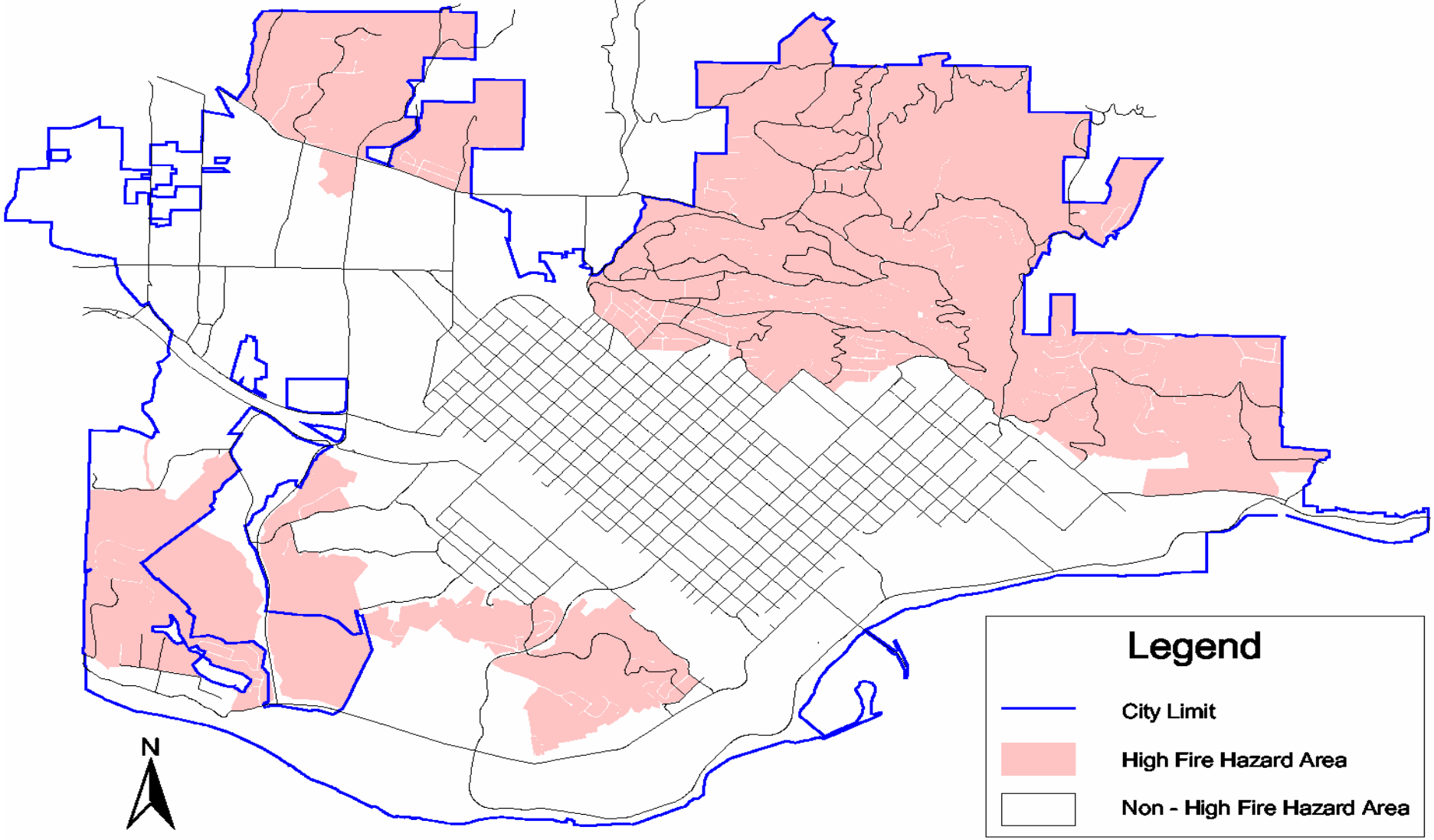


Figure 6

ROOF TYPE

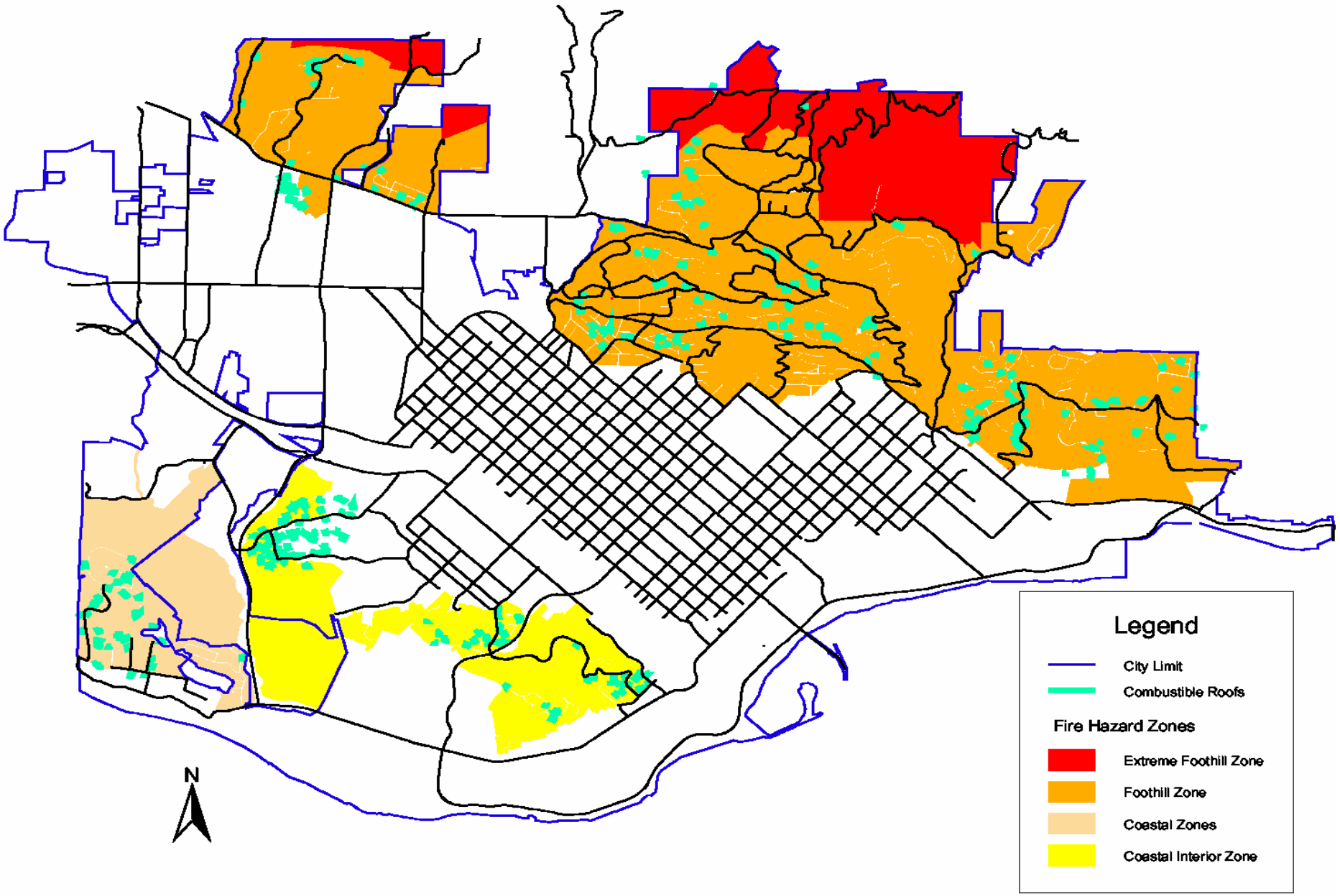


Figure 7

PROXIMITY OF STRUCTURES

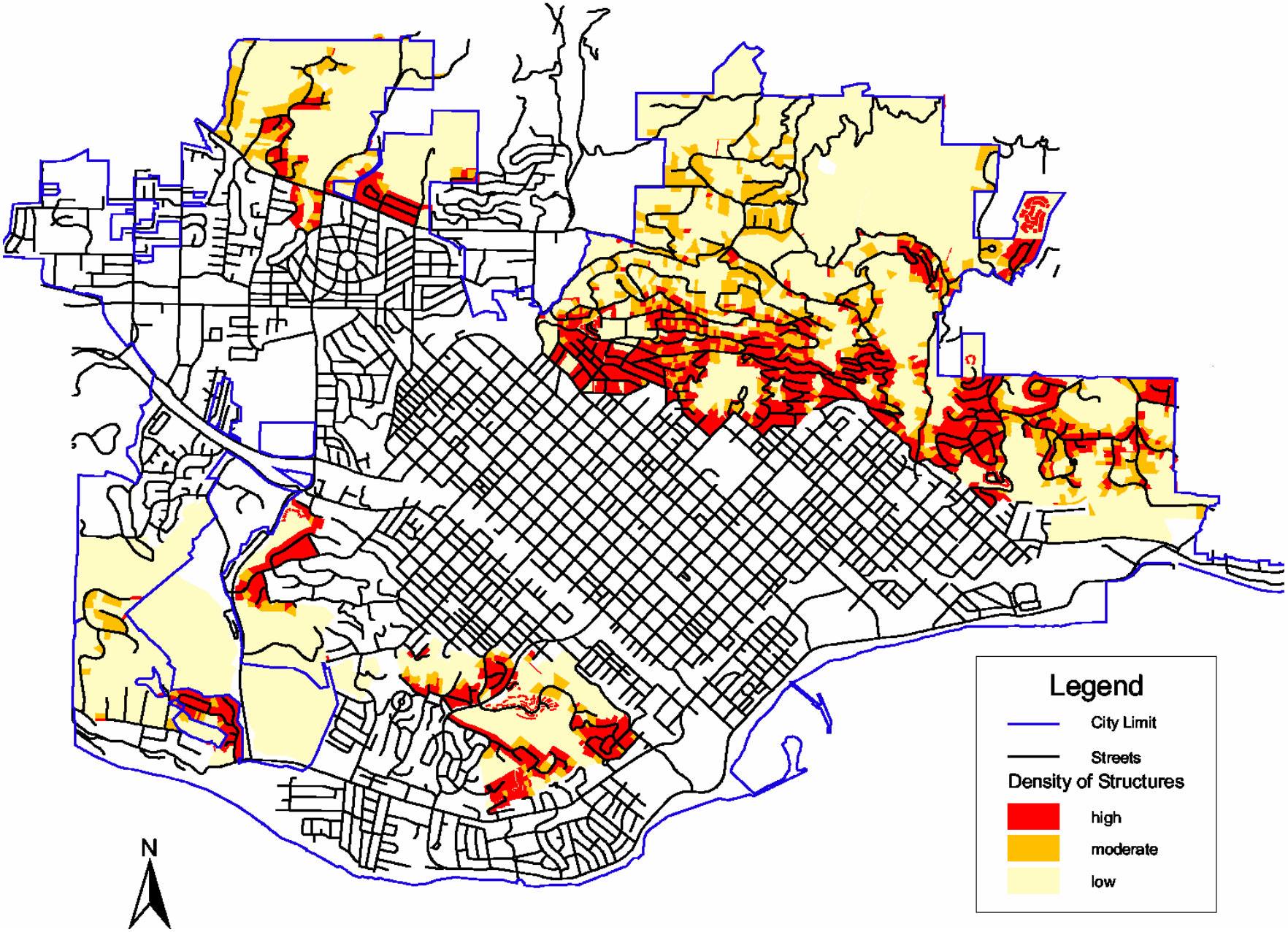


Figure 8

ROAD SYSTEMS

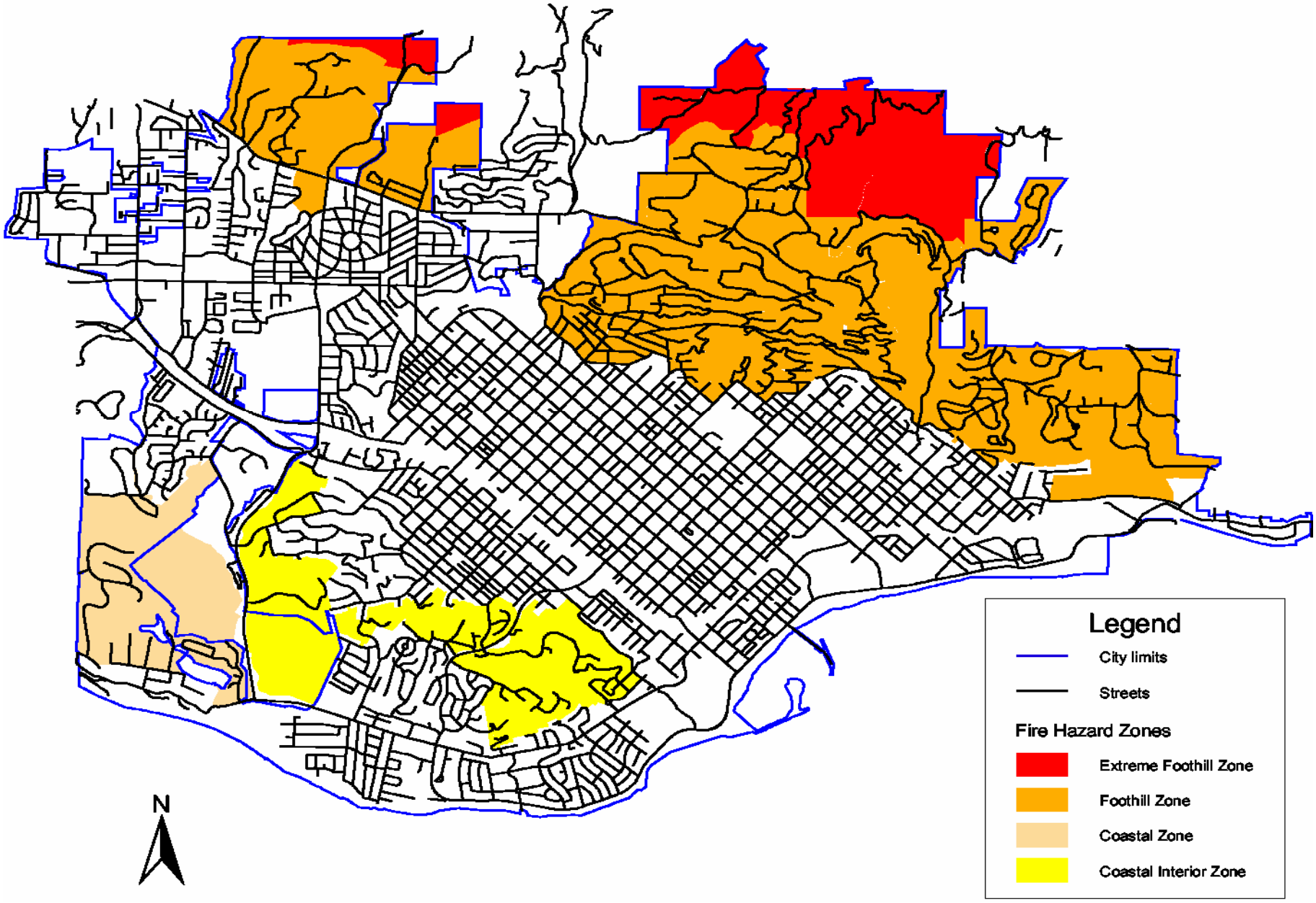


Figure 9

WATER SUPPLY

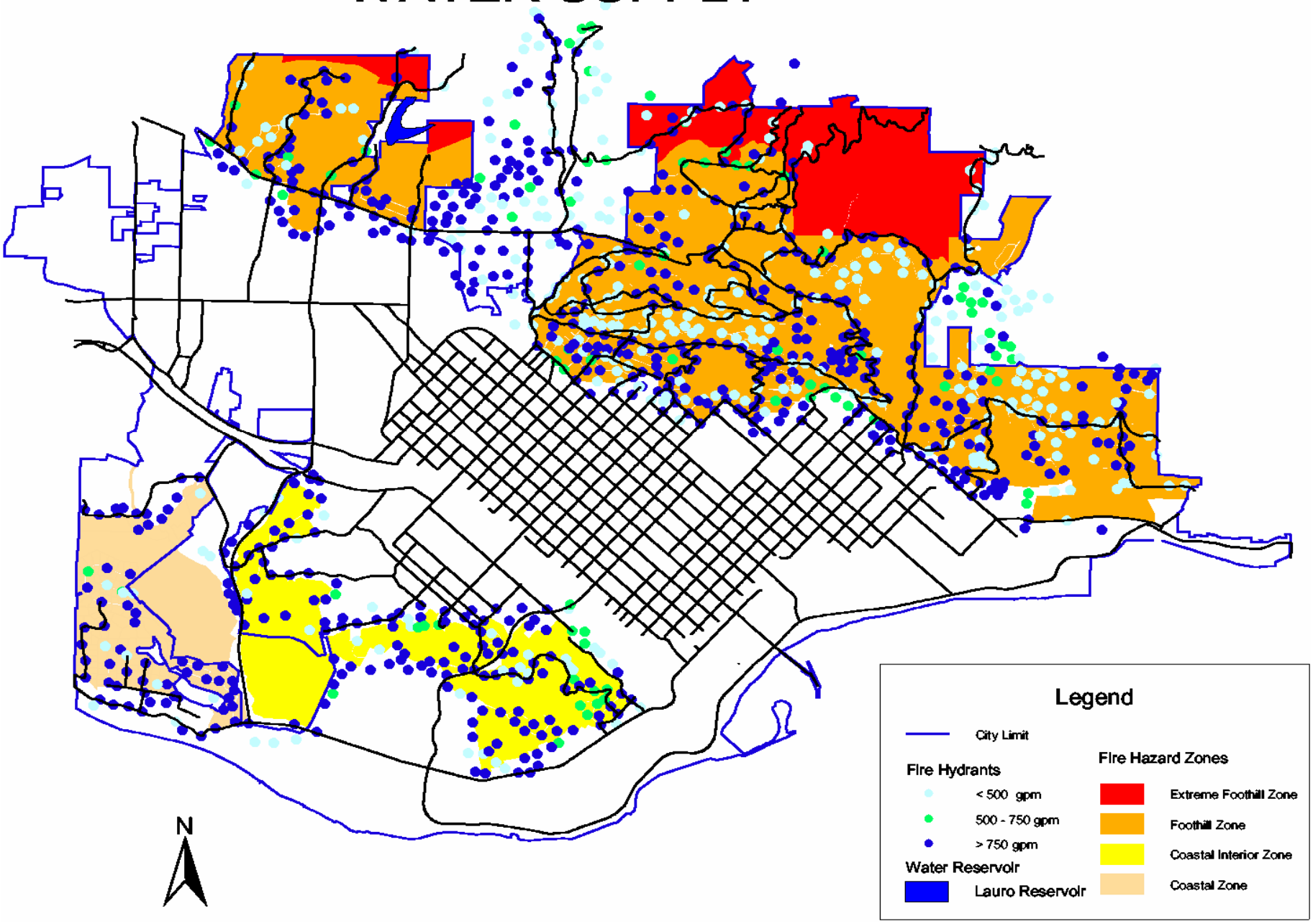


Figure 10

FIRE RESPONSE TIME

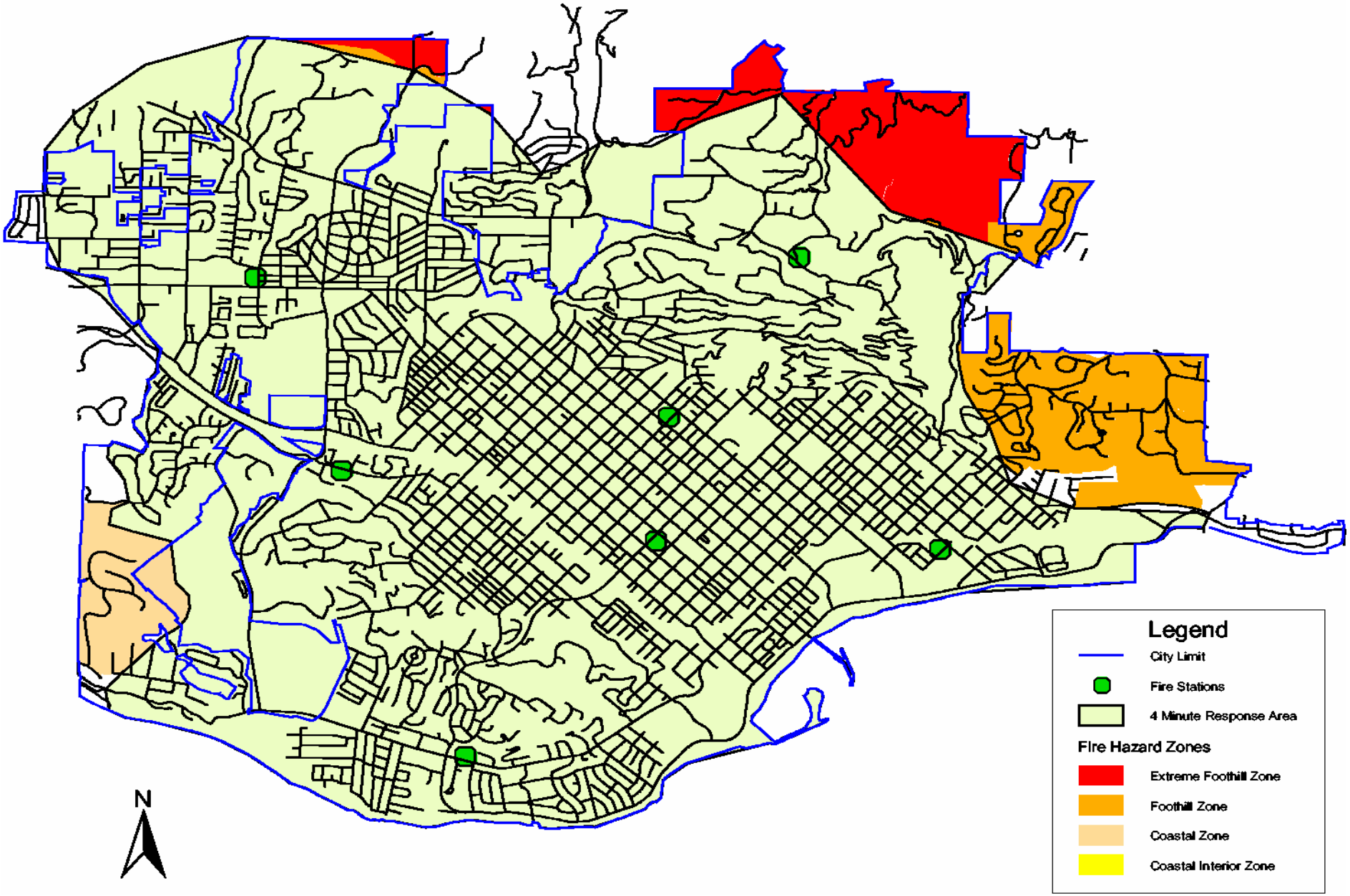
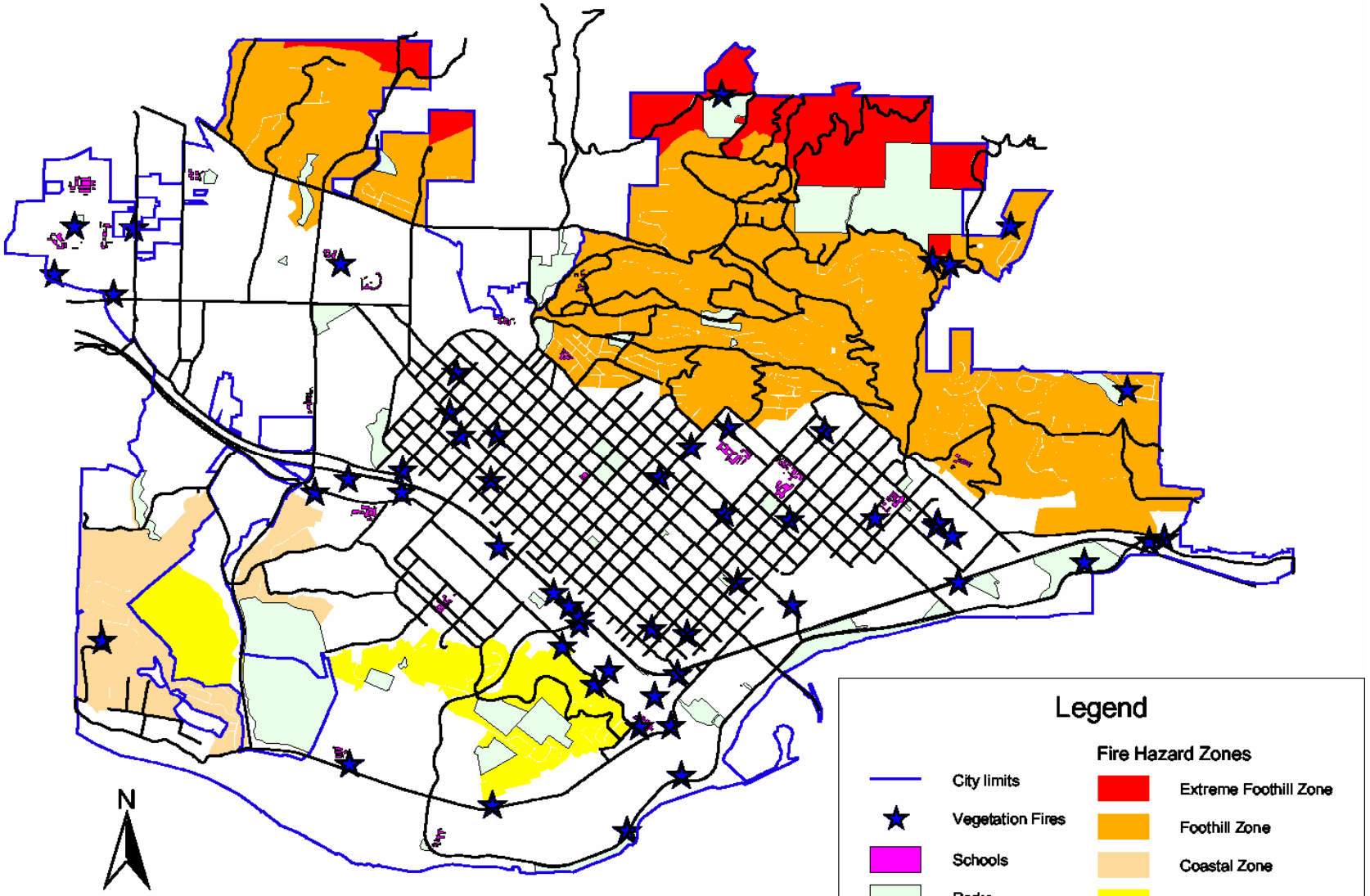


Figure 11

VEGETATION FIRE STARTS



*Map based on data taken from Fire Department response records for a five year period . Data covers 1995 through 2000.

Figure 12

STRUCTURES THREATENED

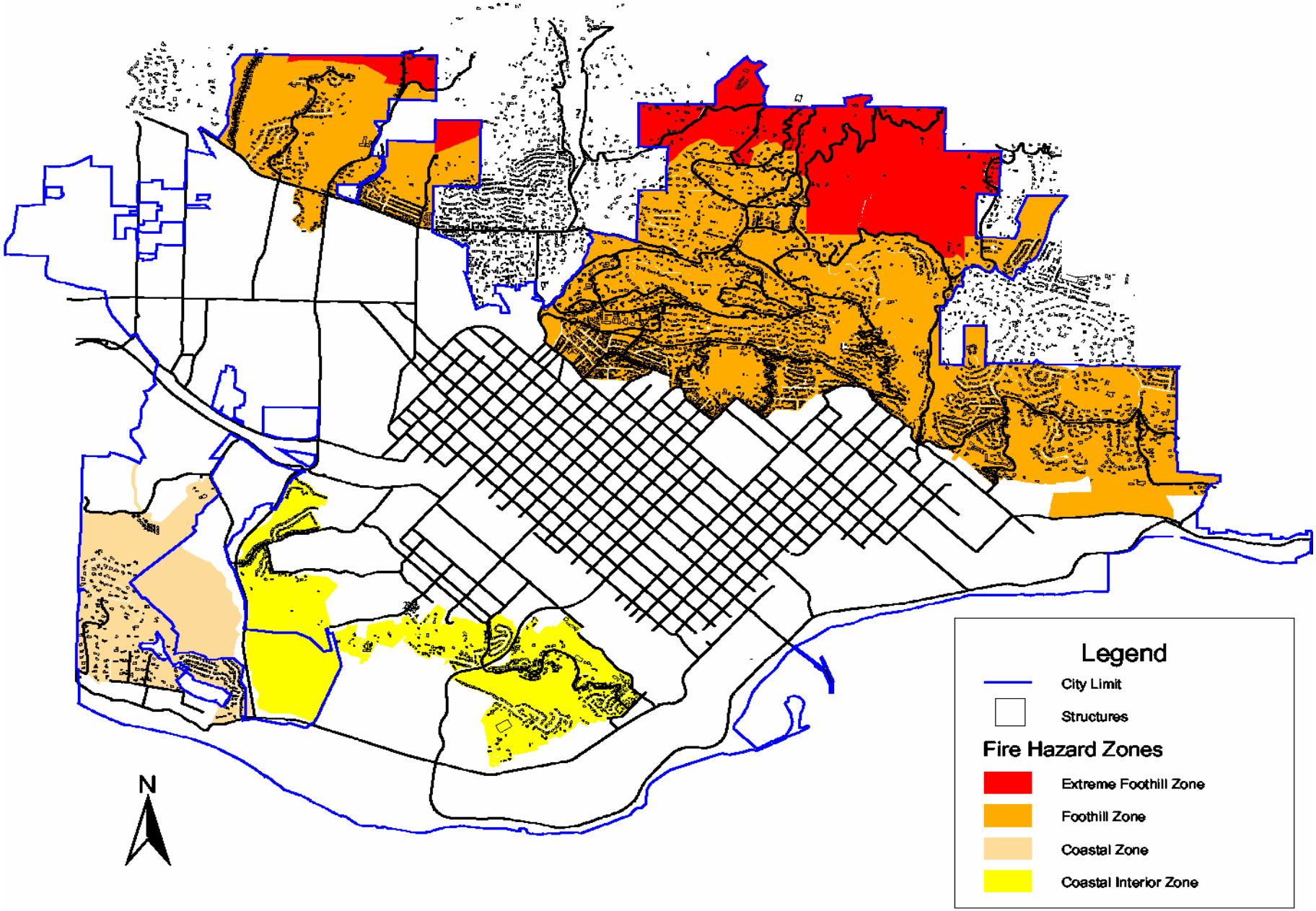


Figure 13

BIOTIC RESOURCES

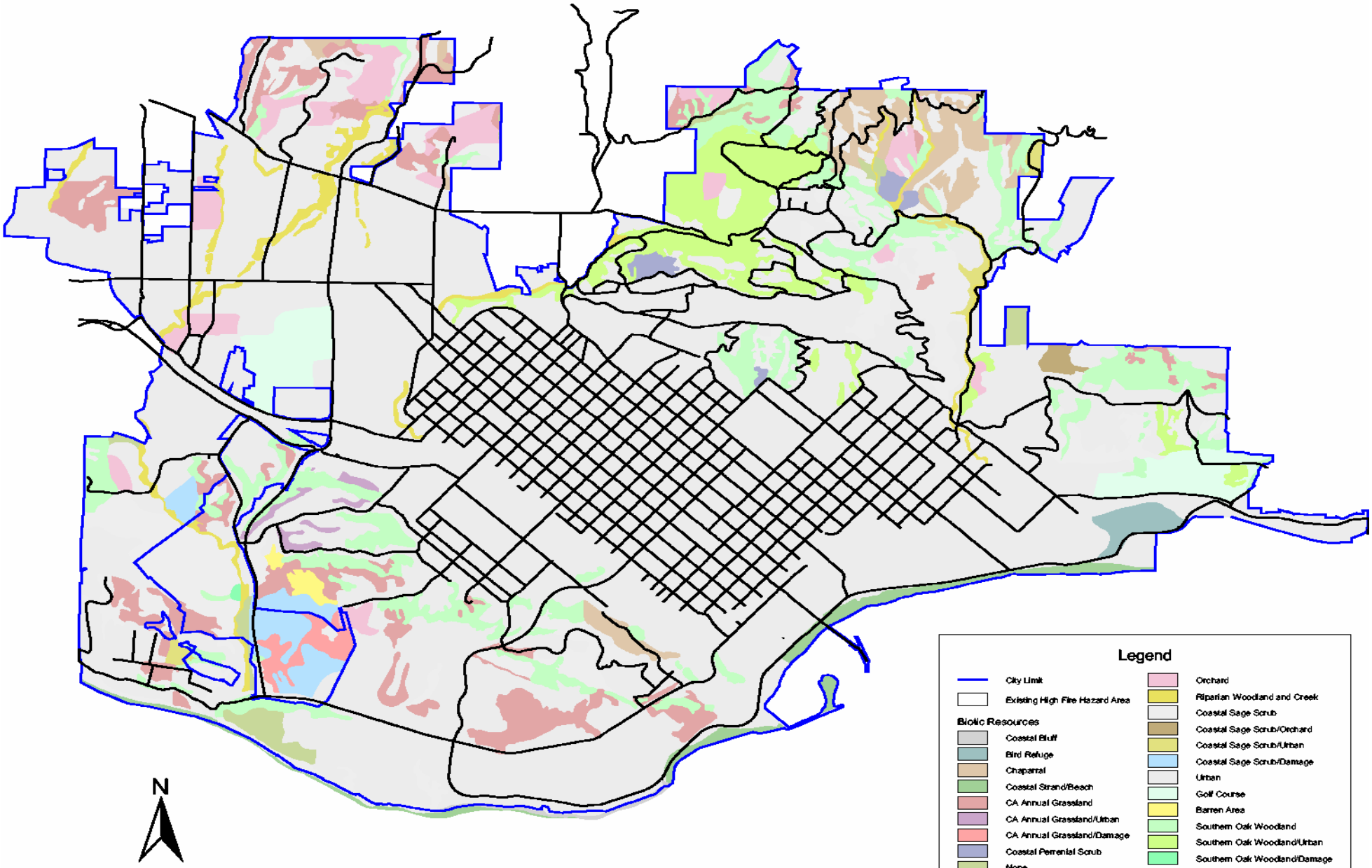


Figure 14

VISUAL RESOURCES

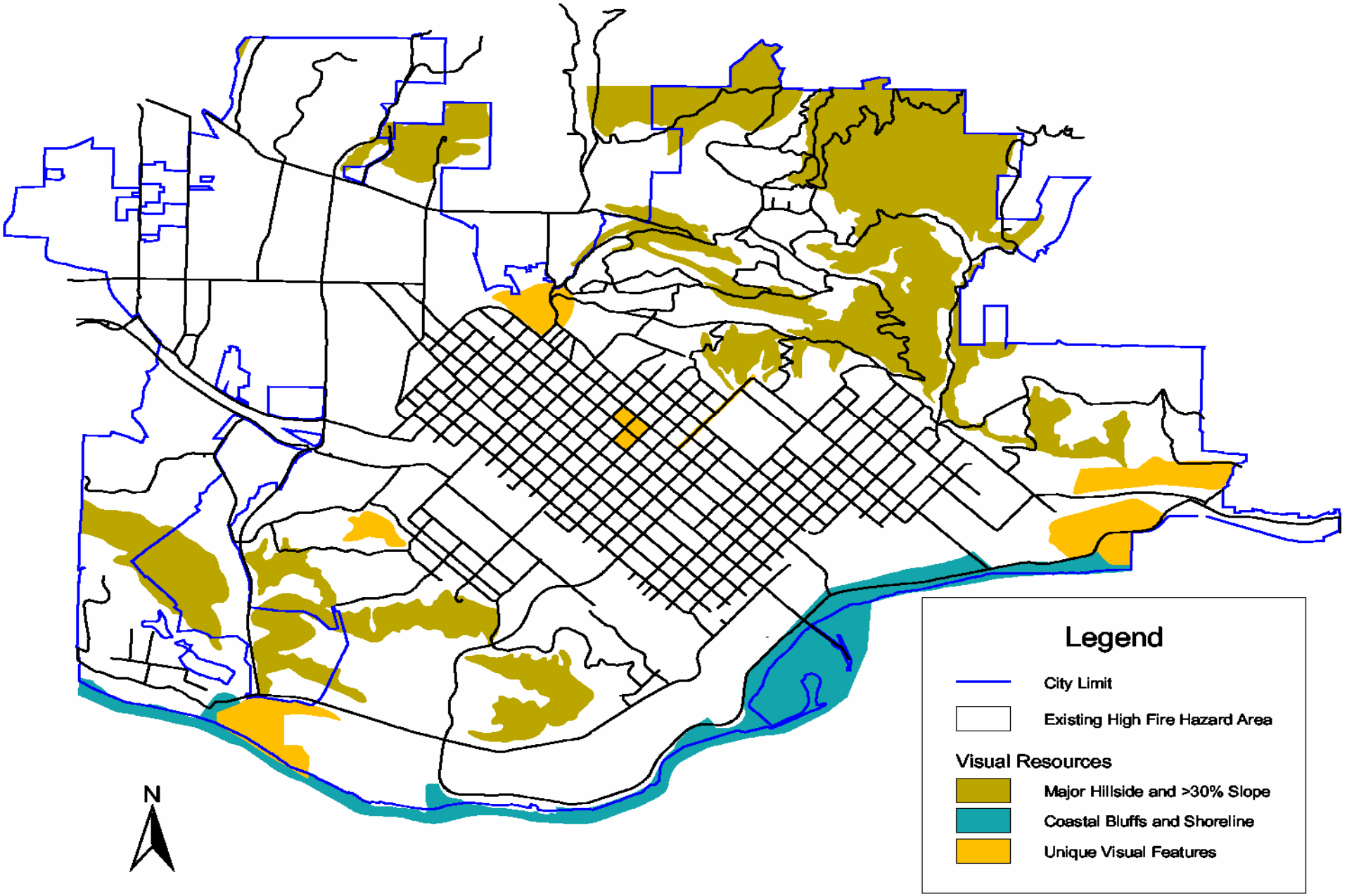


Figure 15

CREEKS

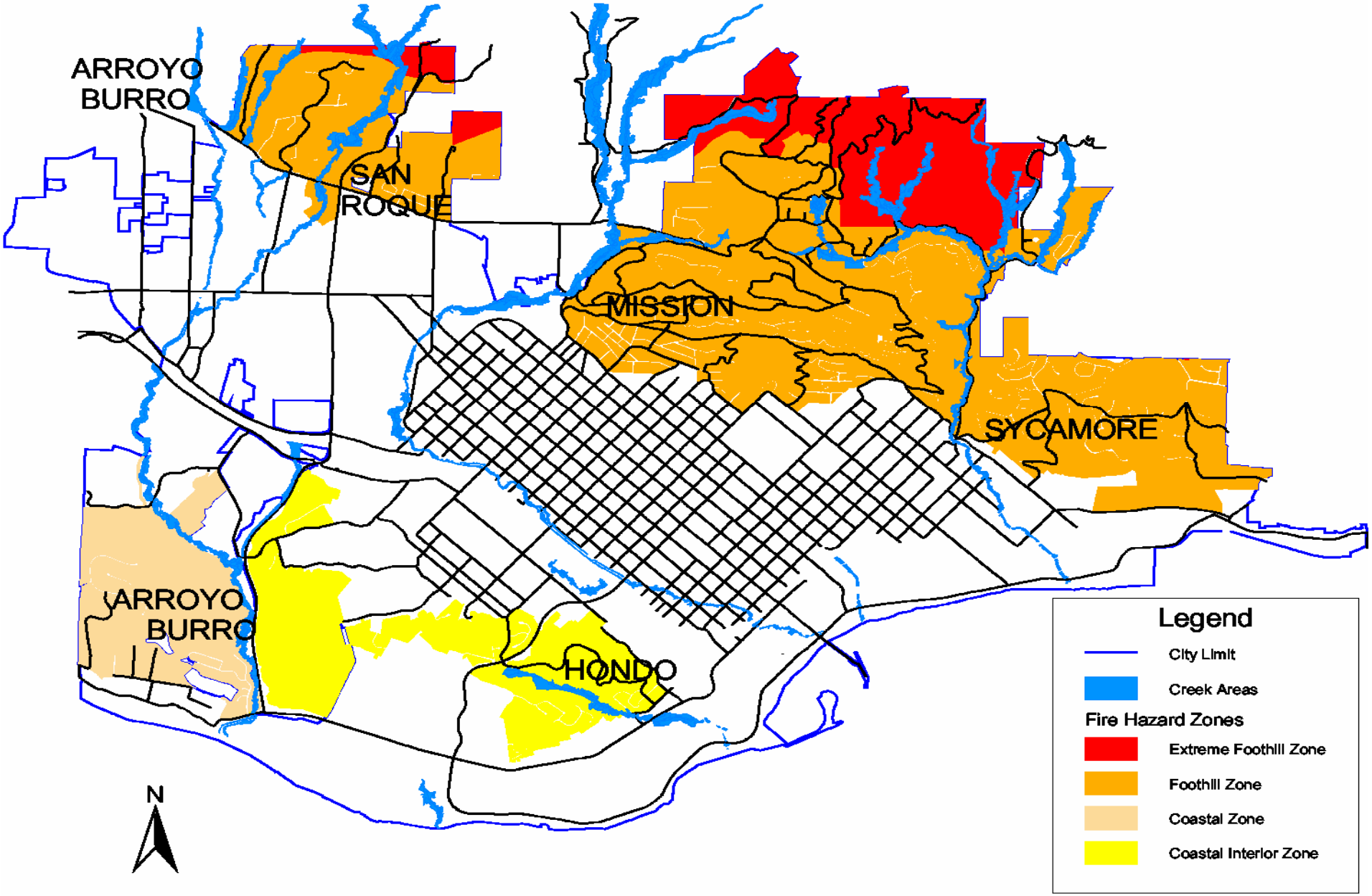


Figure 16

FLOOD ZONES

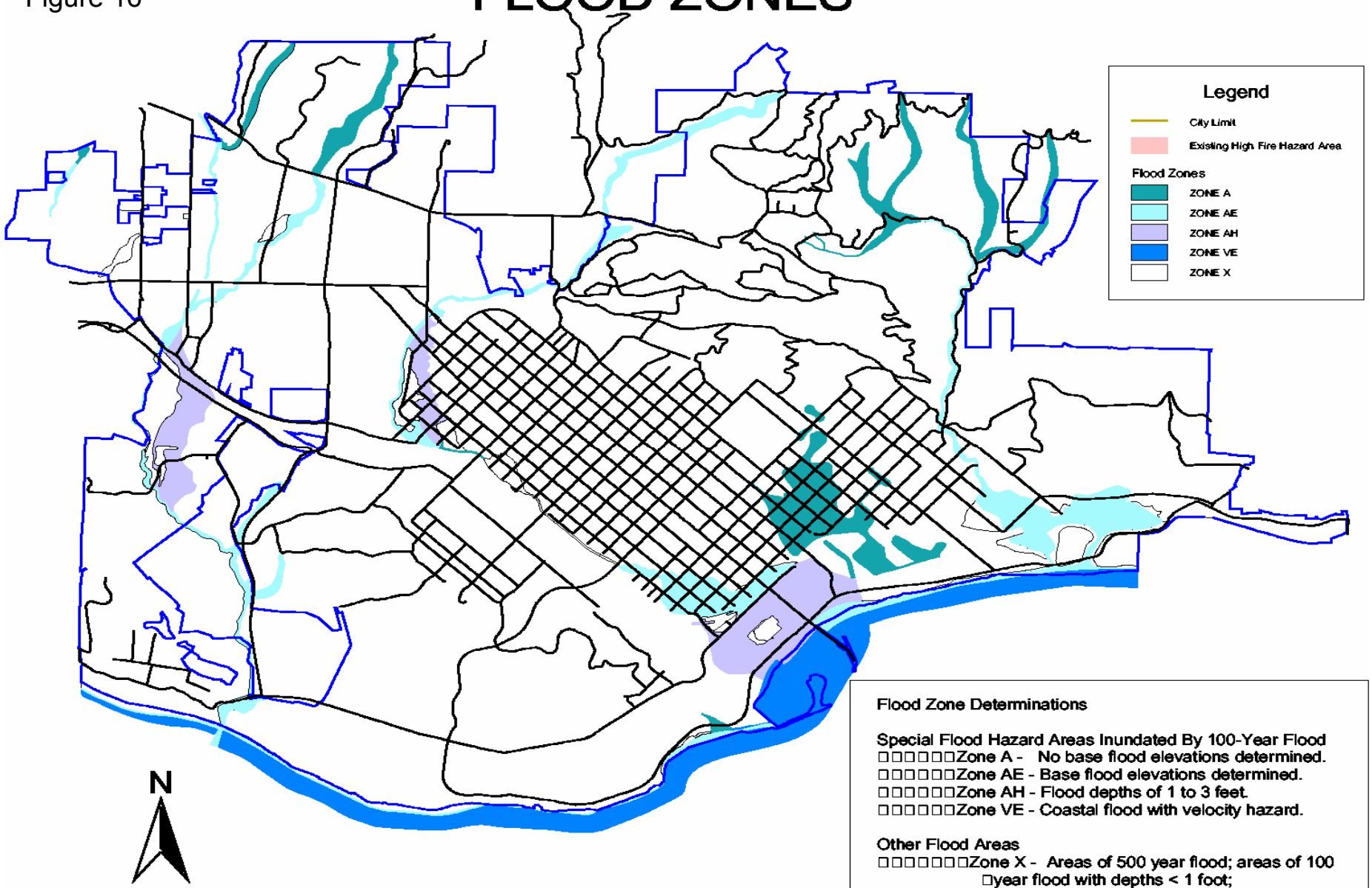
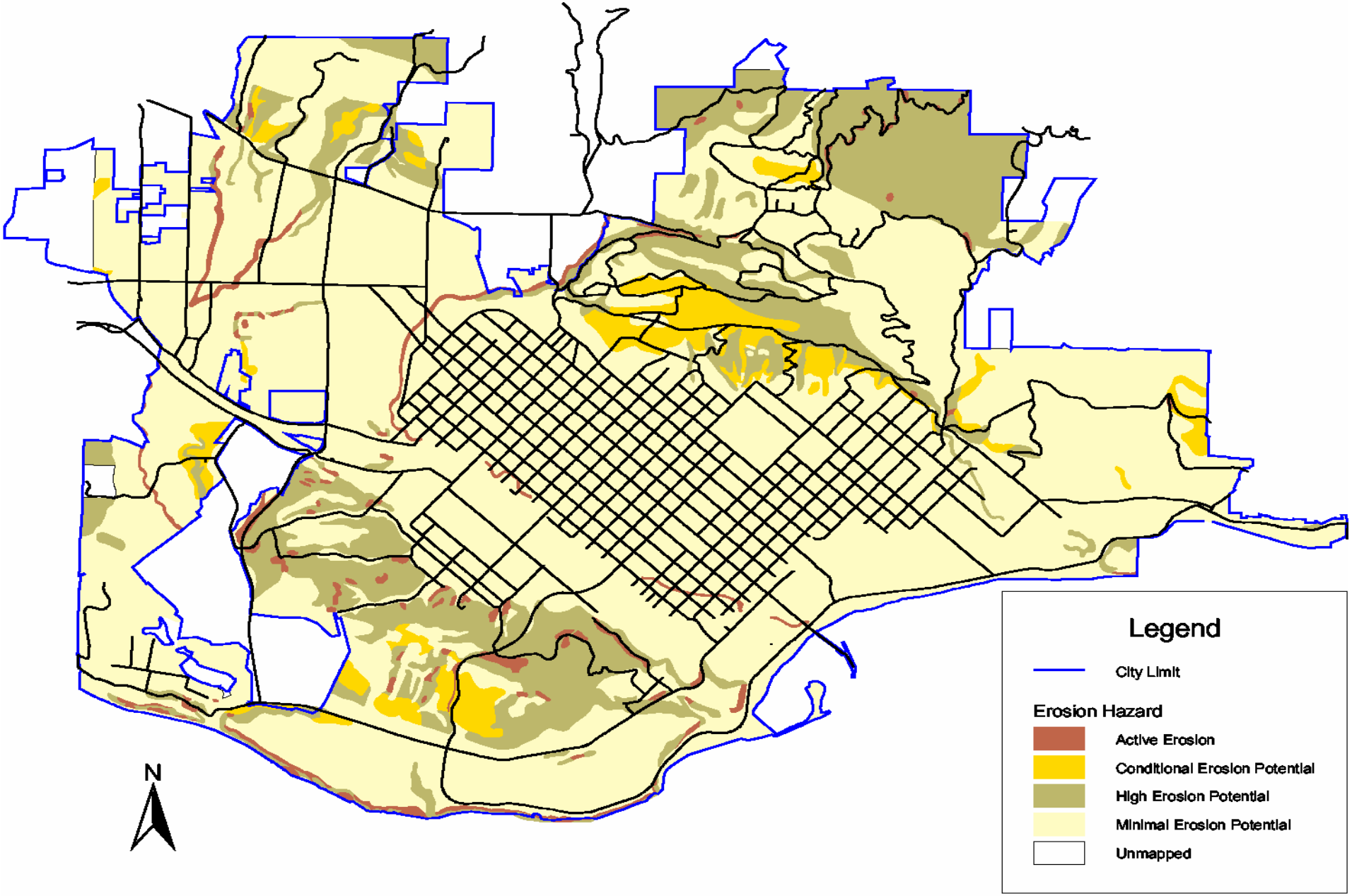


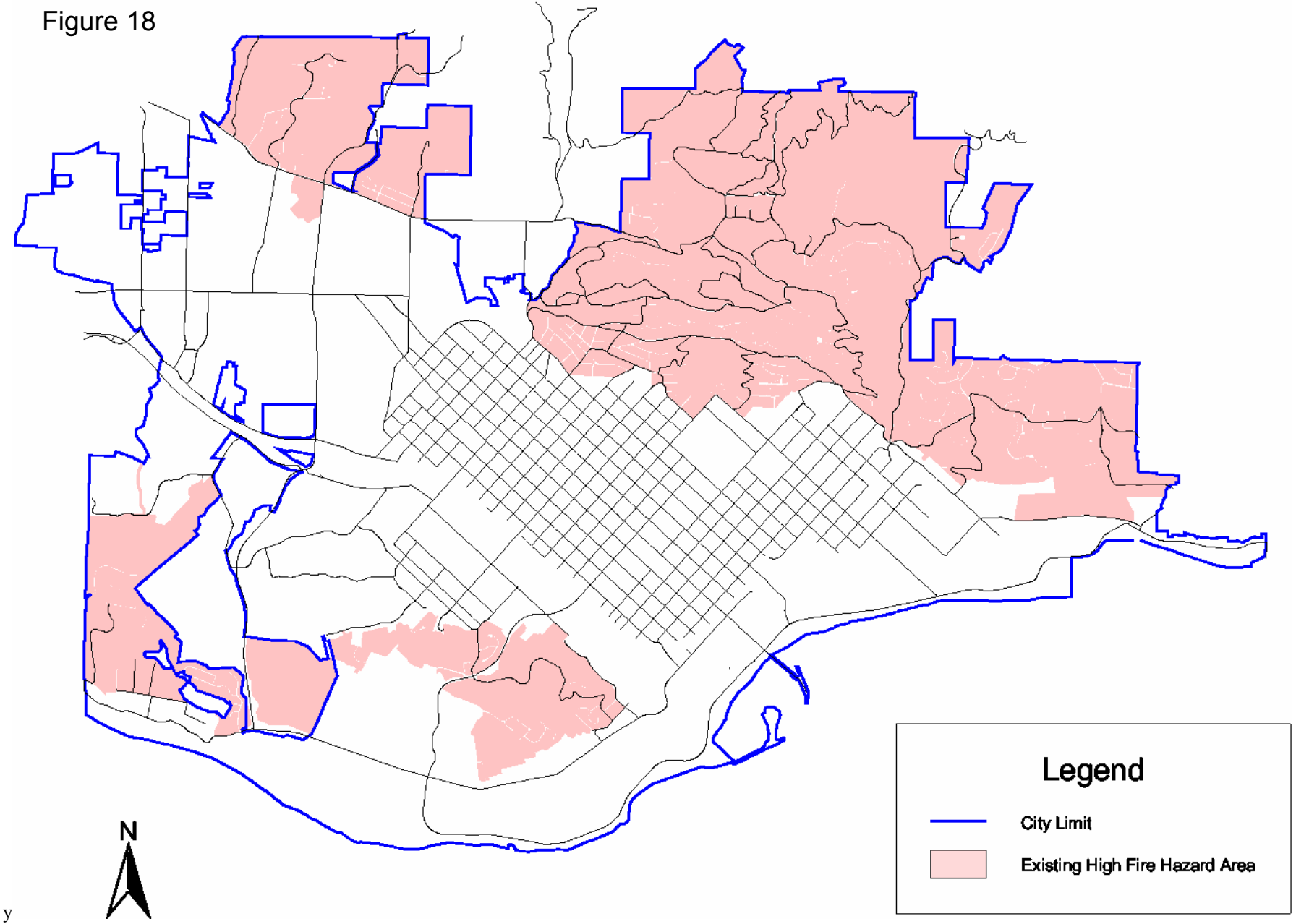
Figure 17

EROSION HAZARD MAP



EXISTING HIGH FIRE HAZARD AREA

Figure 18



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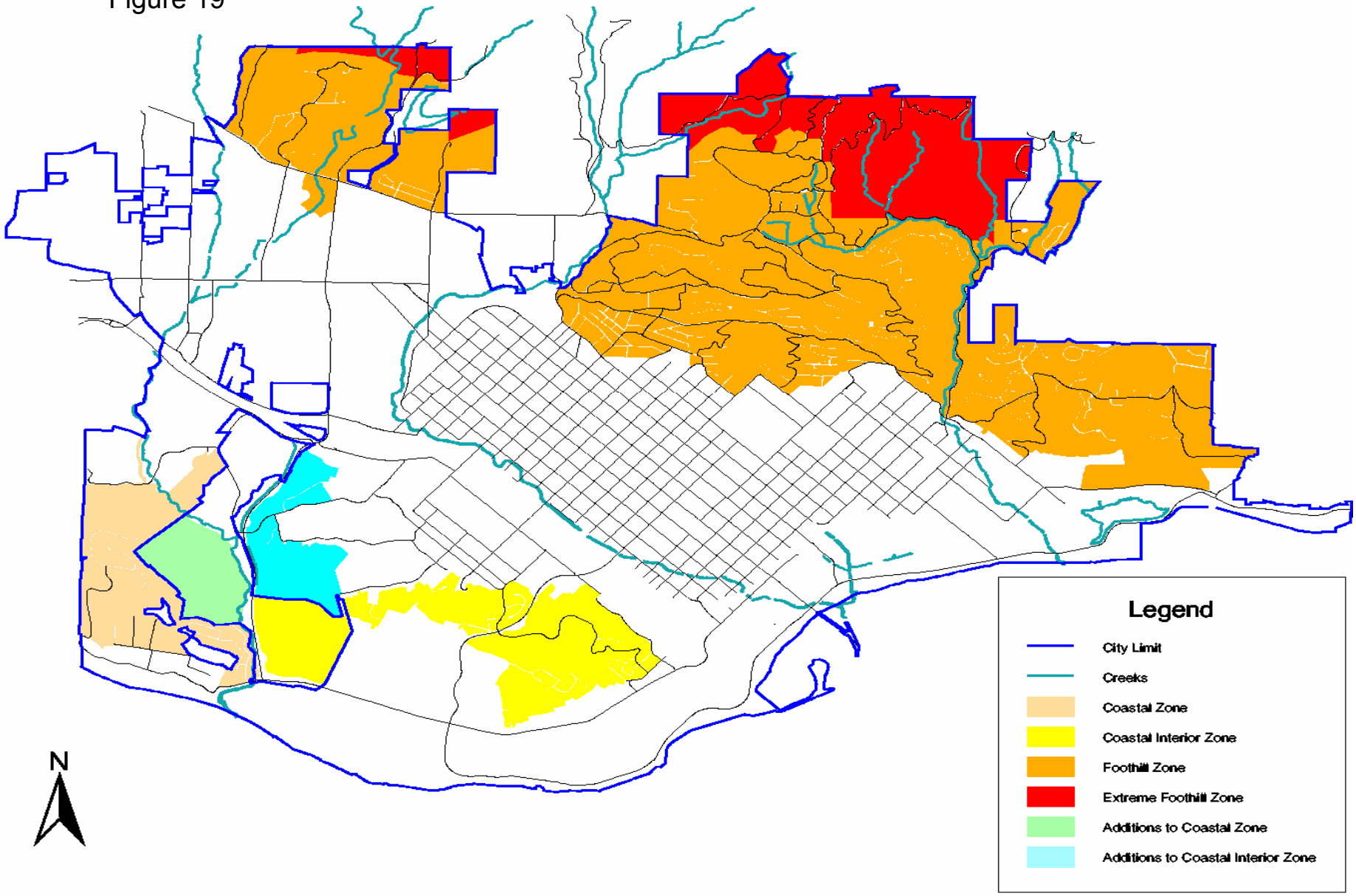
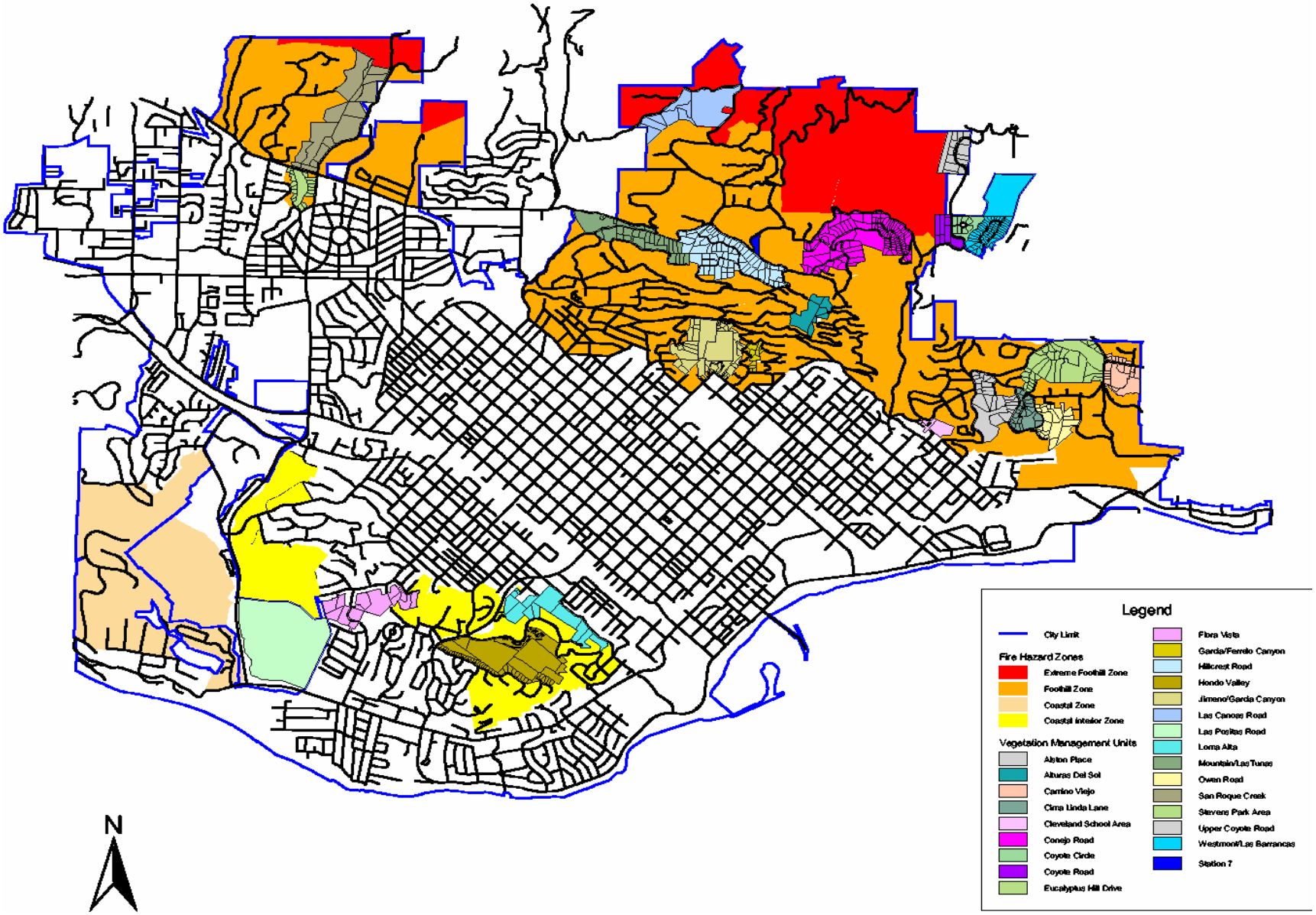
FIRE HAZARD ZONES WITH ADDITIONS TO HIGH FIRE HAZARD AREA

Figure 19



VEGETATION MANAGEMENT UNITS

Figure 20



SB City Sphere of Influence

Figure 21

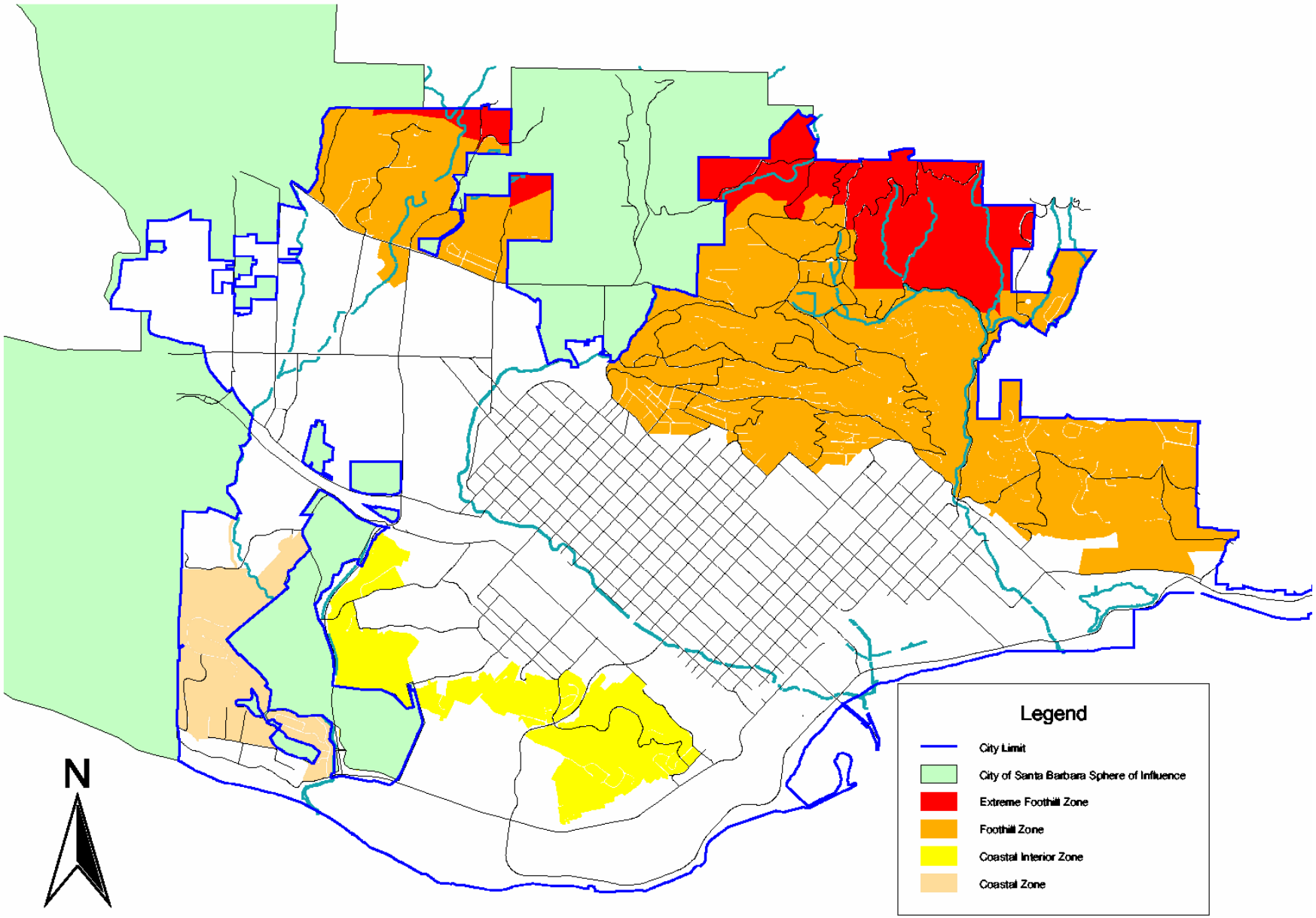


Table 2: Risk - Extreme Foothill Zone

RISK FACTOR	RISK FINDINGS
Roof Type	• The risk of structures igniting as a result of roof type is low. • Out of the 138 structures identified, only 1 has a combustible roof.
Proximity of Structures	• The risk of structure loss due to the density of homes is considered low. • The number of structures could increase if development continues in this zone.
Road Systems	• The risk in this area related to road systems is considered high . • The main roads within this zone met Fire Department access standards. • Enough smaller residential roads, driveways, bridges, and addressing in this zone do not meet Fire Department access standards, especially in the Las Canoas area. The risk is increased along these residential road due to vegetation encroachment that further narrows residential roads and drives.
Water Supply	• Limited water supply in parts of this zone increase the risk in this area to high. • 50 % of the existing fire hydrants in this area meet Fire Department Water Supply Standards of greater than 750 gpm. However, the fire hydrant system only covers portions of this zone. The City water line supplies adequate water supply to the upper San Roque area and areas along West Mountain Drive from Gibraltar Road, east to 1421 West Mountain Drive. • City water is unavailable from 1421 West Mountain Drive, going east along West Mountain Drive to Coyote Road. • Because of the lack of water supply, this area falls within the Fire Department's Fire Zone 2, which requires a minimum 5,000 gallon water tank be installed for each residential development. • These water tank systems limit fire control to structure protection, not outside fire exposures. • To reduce the fire risk a more stable water supply system is needed. • Pump Stations – No pumps stations in this zone, water is gravity flow. • Lauro Reservoir is located on the northwest portion of this zone and would be used for helicopter aerial operations.
Fire Response Times	• This zone is considered at high risk related to fire response. • Much of this zone is outside the Fire Department's 4 minute response time. • During periods of high fire danger weather the risk of a large wildland fire becoming established is high. • Mountain Drive Volunteer Fire Department is active in this area. The department has a Type 4 fire engine with not more than a 200 gallon tank capacity. • Response times for the volunteer department will vary depending on the availability of volunteers.
Fire Ignitions	• Historical fire ignitions within this zone are low. • Two large historic fires started in this zone, the 1964 Coyote Fire, and the 1977 Sycamore Canyon Fire. Both fires started under down canyon wind conditions. • Because of the combination of heavy fuels, long fire response times, and historic fire weather patterns that exist in this zone, it is considered an area at high risk of a large fire becoming established.

Table 3: Risk – Foothill Zone

RISK FACTOR	RISK FINDINGS

Roof Type	• The risk of structures igniting as a result of roof type is moderate.
	• Out of the 4,308 structures identified in this zone, 130 have combustible roofs.
	• Combustible roofs according to neighborhoods are:
	  o Riviera - 2,823 structures identified / 70 with combustible roofs.
	  o Eucalyptus Hills - 911 structures identified / 41 with combustible roofs.
	  o Northridge/Santa Theresita/Ontare/Stevens Park - 574 structures identified / 19 with combustible roofs.

Density of Structures	• The risk of structure loss due to the density of homes in this zone is considered high.
	• Areas of highest density are:
	  o Between Alamar Road and Laurel Canyon above Foothill Road
	  o Area surrounding Stevens Park
	  o Riviera area south of Alameda Padre Serra
	  o Area directly along Alameda Padre Serra
	  o Area surrounding the County Bowl
	  o Area north of Alameda Padre Serra
	  o West of Barker Pass Road
	  o Westmont Road area
	• Many of these higher density areas are located on steep slopes that increase the potential for radiant heat exposure.
	• The remaining structures in the Foothill zone range from moderate to very low density.

Road Systems	• The risk in this area related to road systems is high . • The main roads are a mixture of conforming and existing non-conforming. • Many roads (both residential and main) are further narrowed due to vegetation encroachment and do not meet the Fire Department's access standards. • Portions of this zone have long, steep, inadequately addressed driveways that pose a significant safety hazard, however, the majority of homes in this zone have adequate addressing. • Approximately 20 bridges exist throughout this zone, a number of these bridges are considered existing non-conforming due to weight limitations.
Water Supply	• Adequate water supply in this zone makes the risk in this area low. • Fire hydrants meet Fire Department Water Supply Standards. Fire hydrants within this zone are located every 500 feet and meet Fire Department standards. • Lauro Reservoir is located just north of this zone, but would be used for helicopter aerial operations.
Fire Response Times	• This zone is considered at moderate risk related to fire response. • The majority of areas within this zone are within the Fire Department's 4-minute response time. • Two areas, Westmont Road, and the eastern area of Eucalyptus Hill area, are outside the 4-minute response time. • Montecito Fire Station 2 is located within a 4-minute response time to these areas and would respond under the City Mutual Aid Agreement to an emergency in this area.
Fire Ignitions	• Fire ignitions within this zone are low. • Because of the population density and diverse public uses in this zone, the risk of a large fire becoming established is moderate under high fire danger weather.

Table 4: Risk – Coastal Zone

RISK FACTOR	FINDINGS
Roof Type	• The risk of homes igniting as a result of roof type is moderate. • Out of the 570 structures identified in this zone, 29 have combustible roofs.
Proximity of Structures	• The risk of structure loss due to the density of homes in this zone is considered low. • One exception to this is the Alan Road area where the density of homes is high and the risk of structure loss is considered high.
Road Systems	• Road systems in this zone are considered low risk. • The majority of road systems meet Fire Department access standards. • No private bridges were identified in this zone.
Water Supply	• Adequate water supply in this zone makes the risk in this area low. • Fire hydrants meet Fire Department Water Supply Standards. Fire hydrants within this zone are located every 500 feet and meet Fire Department standards. • Lauro Reservoir is located on the northern boundary of the City, but would be used for helicopter aerial operations in this zone.
Fire Response Times	• This zone is considered at moderate risk related to fire response. • The majority of area is within the Fire Department's 4-minute response time. • The Campanil Hill and upper part of Sea Ranch Drive are outside the Fire Department's 4-minute response time.
Fire Ignitions	• Historic fire ignitions within this zone are low. • Because of the coastal weather influence in this zone the risk of a large fire becoming established is low.

Table 5: Risk - Coastal Interior Zone

RISK FACTOR	FINDINGS
Roof Type	• The risk of homes igniting as a result of roof types is high. • Out of the 365 structures identified in this zone, 65 have combustible roofs. • Many of these structures are adjacent to undeveloped lands or Open Space parcels that increase their exposure to fire brands igniting roof tops. • A high number of structures in the Bel Air Knolls area have combustible roofs. • Many structures directly adjacent to the proposed High Fire Hazard Zone, within the Bel Air Knolls area, have combustible roofs and are at high risk of burning from wind driven firebrands, igniting roof tops well ahead of the main fire.
Proximity of Structures	• The risk of structure loss due to the density of homes in this zone is considered high. • Many of these homes are adjacent to undeveloped lands or Open Space parcels that increase their exposure to radiant heat generated from burning vegetation.
Road Systems	• Road systems in this zone are considered low risk. • The majority of road systems meet Fire Department access standards. • No private bridges were identified in this zone.
Water Supply	• Adequate water supply in this zone makes the risk in this area low. • Fire hydrants meet Fire Department Water Supply Standards. Fire hydrants within this zone are located every 500 feet and meet Fire Department standards. • Lauro Reservoir is located on the northern boundary of the City but would be used for helicopter aerial operations in this zone.
Fire Response Times	• This zone is considered at moderate risk related to fire response. • All of this zone is within the Fire Department's 4-minute response time.
Fire Ignitions	• Historic fire ignitions within this zone are low. • Because of the coastal weather influence in this zone the risk of a large fire becoming established is low.

Chapter 3- Fire Protection

3.0 Fire Protection Philosophy

The Santa Barbara City Fire Department provides a complete range of fire protection, prevention, and educational services to the City and its residents. The department is largely staffed and equipped for structural fire protection, but in recent years has put greater emphasis on equipment, training, and staffing in wildland fire protection and prevention. The Fire Department recognizes that wildland fire in the City is inevitable.

The department also recognizes the need to develop a long-range wildland fire plan to reduce the catastrophic results of wildfire. Without this plan the ability to prioritize, fund, and implement projects and programs to minimize the impact of wildfire in our community would be jeopardized.

3.0.1 Public and Fire Safety

The first priority of the Fire Department is to protect public lives and maintain safety. Safety is first and foremost in the Fire Chief's fire protection philosophy and strategic plan. The department's mission statement, Standard Operating Procedures, training, fire protection, and fire prevention activities all support this priority.

3.0.2 Protection of Structures

The protection of structures is the Fire Department's second priority. The ability to protect structures during a wildfire is complex. Much of the City was developed before the adoption of building and fire codes that required non-combustible roofing and building materials, adequate fire department access or water supply standards in high fire hazard areas. These existing non-conforming structures are at greater risk of loss than structures that meet current building, access, and water standards and limit the ability of the Fire Department to provide adequate structure protection. Added to the complexity is the high percentage of homes (both existing conforming and non-conforming structures) that do not have adequate defensible space or vegetation clearance around structures and along driveways and roadways.

3.0.3 Protection of Natural Resources

The third priority for the Fire Department is to protect natural resources. The protection of natural resources has changed considerably over the years for fire agencies. Fire suppression and fire prevention strategies and procedures attempt to balance the need for wildland fire safety and protection of resources. The complexity of protecting lives and property, along with natural resources is a reality for the fire department.

The chaparral environment within the city and surrounding areas has adapted over millions of years with fire as a natural part of its ecosystem. Current and past fire exclusion and suppression policies have resulted in large accumulations of flammable vegetation on hillsides. When these areas burn under wildfire conditions, they result in intense fire behavior and increase the potential for resource damage. The department realizes the best way to provide wildland fire protection and to protect natural resources is to implement a wildland fire plan that develops

policies and actions to reduce accumulations of vegetation, enhance natural resources and reduce their vulnerability to wildfire.

3.1 Fire Protection Strategies

Fire protection strategies for each fire hazard zone were developed using the results of the hazard and risk assessment, predicted fire behavior, and firefighting resources used by the Fire Department for wildland fire suppression.

Fire behavior calculations were completed for each fire hazard zone using BEHAVE fire behavior modeling system (*See Appendix D, Fire Behavior Modeling*) and characterized as extreme, high, moderate or low fire behavior. Evaluating fire behavior allows fire personnel to predict the rate of spread of a fire, its intensity, and the ability for fire suppression resources to control the fire. This allows fire personnel to make tactical decisions in fighting a fire and helped in developing fire protection service policies and actions.

Extreme fire behavior implies a level of fire behavior that would not allow fire suppression resources to directly attack the fire. Fires burning with extreme fire behavior develop their own fire environment, produce extreme intensities and often erratic behavior. These fires are extremely dangerous for firefighters and the public. Extreme fire behavior is also characterized by many burning embers that become airborne and get carried well ahead of the fire front starting new fires (spotting)and burning of tree canopies, torching of individual trees, and major fire runs occurring within short periods of time. Fire engines, dozers, and aerial air tankers or helicopters are ineffective in the suppression of these types of fires.

High fire behavior implies a level of fire behavior that would normally not allow for fire suppression resources to directly attack the fire because of high fire intensities. These types of fires present serious control problems because of probable spotting well ahead of the fire front, fire burning into the canopy of trees and torching of individual trees. Fires burning with high fire behavior can quickly change to extreme behavior depending on the time of day, the vegetation type, and the topography. Fire engines, dozers, and aerial air tankers or helicopters can be effective on these types of fires depending on the topography, winds, and type of vegetation.

Moderate fire behavior is usually too intense for suppression personnel to directly attack the fire, but tactics that attack the flank of the fire can be used. These types of fires are potentially dangerous to firefighters if weather, fuel, or topography conditions change. These types of fires are generally in flashier, lower growing vegetation (such as sage) and have the potential to move quickly. Spotting ahead of the fire would occur, but spotting would be shorter in distance than extreme fire behavior. Torching of individual trees would occur. Fire engines, dozers, and aerial air tankers or helicopters are effective on these types of fires.

Low fire behavior implies a level of fire behavior that would generally allow a fire to be directly attacked or flanked. Because these fire are typically in low growing, flashy vegetation and burn quickly they are potentially dangerous to firefighters if weather, fuel, or topography conditions change. However, intensities are generally low. Fire engines, dozers, and aerial air tankers or helicopters are very effective on these types of fires.

For fire suppression resources like most California communities, the City Fire Department relies heavily on mutual aid resources to augment our firefighting resources if a wildfire or other emergency situation occurs. No community has the resources sufficient to cope with any and all emergencies for which the potential exists. The City of Santa Barbara is no exception. In times of large scale wildfires and disasters the City of Santa Barbara relies on neighboring agencies to provide equipment and personnel for fire suppression, prevention, and investigation of wildfires. Likewise, when called upon, we provide the same assistance to outside agencies in need. These mutual aid resources are designated through Mutual Aid Agreements developed with the surrounding fire agencies, as well as the state and federal agencies.

Fire protection strategies for each fire hazard zone are described below.

3.1.1 Extreme Foothill Zone

The Extreme Foothill Zone has a combination of heavy vegetation, slopes greater than 30 percent with south and southwest aspects, and drainages that are directly aligned to frequent severe, hot dry wind conditions.

Because the majority of this zone is outside the department's 4-minute response time, the potential of an ignition becoming a large scale fire increases during periods of high fire danger is high.

The department has 7 stations, with 3 person engine companies available to respond to wildland fires 24 hours a day. During the designated Fire Season an initial dispatch to a wildland fire would be 3 fire engines and a Battalion Chief. On a second alarm, additional City engines would be dispatched and the department would rely on mutual aid resources from neighboring agencies to fill additional engine company needs. On a second alarm fire cooperating resources could arrive on scene anywhere from 10 to 30 minutes or greater after the first alarm. On a third alarm fire response, fire engine and equipment response would exceed 30 minutes. The Mountain Drive Volunteer Fire Department is active in this zone and has a fire engine with 200 gallons of water that would respond to fires in this area as available.

Aerial fire suppression resources may be available to the department within the first 15 minutes of a fire ignition, depending on wildland fire activity. The Los Padres National Forest (LPNF) has one Type 1 air tanker stationed at the Santa Barbara Municipal Airport, one Type 1 helicopter stationed at Arroyo Grande, and one Type 2 helicopter stationed at the Santa Ynez airport. Santa Barbara County Fire has one Type 2 helicopter stationed at the Santa Ynez airport and Ventura County has two Type 2 helicopters stationed at the Camarillo airport. Still many of these resources cannot be fully relied on since they may be dispatched during times of high fire danger to other wildfires throughout the county, state, or nation.

Fire behavior in this zone, under high fire danger weather or Sundowner/Santa Ana winds would be extreme. The 1990 Painted cave Fire, the 1977 Sycamore Canyon Fire, and the 1964 Coyote Fire burned under Sundowner wind conditions and produced extreme fire behavior conditions. Fire behavior predictions completed for this zone (See Appendix D), under a 30 mile per hour Sundowner wind condition, on a 30 percent slope, covered with heavy brush, indicate that the fire would consume 77 acres within the first 6 minutes and 308 acres within 12 minutes, quickly depleting fire suppression resources. Fire behavior predictions completed for a 10 mile per hour

normal upslope wind, on a 30 percent slope, covered with heavy brush, would consume 10 acres within the first 6 minutes and 41 acres within 12 minutes.

Because of the potential for extreme fire behavior in this zone, structures must be able to stand alone in a wildfire event. Fuels management, defensible space, non-combustible building construction, water supply, and access for fire s become particularly important in this zone.

From a fire protection standpoint, this zone is strategically important to the Fire Department because it provides the last line of defense for fire suppression of a fire burning from the National Forest into more highly populated areas of the City.

A number of staging areas were identified within this zone. Staging areas are strategic locations where fire equipment (fire engines, dozers, and suppression equipment) can be safely placed while awaiting a tactical assignment on the fire. Many staging areas are located outside the boundaries of this zone, but are close enough for a rapid response into the fire. These areas are Skofield Park, Westmont College, Lauro Reservoir, Cater Filtration Plant, La Colina Junior High School, Cold Springs Elementary School, Sheffield Reservoir, and Earl Warren Showgrounds (large scale staging area).

3.1.2 Foothill Zone

This zone has a mixture of heavy brush, heavy canopy fuels from oak and eucalyptus trees, decadent riparian fuels, and landscape vegetation. Slopes range from 20 to 40 percent, with many southeast, south, and southwest aspects and canyons directly aligned to severe, hot dry wind conditions.

The majority of this zone is within the Fire Department's 4-minute response time, except for four areas, Westmont Road, the eastern Eucalyptus Hill Road, Alston Road, and Camino Viejo Road areas. Montecito Fire Station 2 is located within a 4-minute response time to these areas and would respond under the City Mutual Aid Agreement to an emergency in this area.

Like the Extreme Foothill Zone, the department has the same number of engines available to respond and would rely heavily on the cooperating fire agencies and aerial fire suppression resources for fire protection support through Mutual Aid Agreements. This zone has no volunteer fire department.

Fire behavior in this zone, under high fire danger weather or Sundowner/Santa Ana winds, would be high to extreme. The 1977 Sycamore Canyon Fire and the 1964 Coyote Fire burned into this zone under Sundowner wind conditions and produced extreme fire behavior conditions, with heavy spotting up to 1 mile ahead of the main fire front. The heavy canopy cover in this area, especially from eucalyptus trees, increases the amount and size of burning embers that can be carried in down canyon wind conditions, threatening areas well ahead of the fire. Fire behavior predictions completed for this zone (See Appendix D), under a 30 mile per hour Sundowner wind condition, on a 30 percent slope, covered with eucalyptus fuels, indicate that the fire would consume less than 1 acre within the first 6 minutes and again less than 1 acre within 12 minutes. This prediction does not adequately address potential fire behavior that is seen from historic fires in our area under extreme wind conditions. This is due to the inability of the model to predict extreme fire behavior conditions, such as crowning and torching of tree canopies. Fire behavior

predictions completed for a 10 mile per hour normal upslope wind, on a 30 percent slope, covered with eucalyptus fuel indicate that the fire would consume 1/10 of an acre within the first 6 minutes and 3/10 of an acre within 12 minutes. A fire under these conditions would most likely burn along the ground, consuming ground litter and pockets of dead fuel. In heavy brush fuels within this zone, fire behavior predictions would be the same as the Extreme Foothill Zone predictions.

Staging areas in this zone are Skofield Park, Westmont College, Lauro Reservoir, Cater Filtration Plant, La Colina Junior High School, Cold Springs Elementary School, Santa Barbara Tennis Club, Santa Barbara Women's Club, Jefferson School (Brooks Institute), Cleveland Elementary School, Sheffield Reservoir, and Earl Warren Showgrounds (large scale staging area).

3.1.3 Coastal Zone

The Coastal Zone has many diverse pockets of chaparral, oak forests, coastal sage shrub, landscape vegetation, agricultural lands, and eucalyptus groves. Slopes in this zone range from 10 to 35 percent with varying aspects and many dissecting canyons. These canyons are not in direct alignment to receive hot dry winds, although these winds are funneled through many of these areas. The ocean influence dominates the weather pattern in this zone for most of the year. Still, under down canyon wind conditions, the potential for a catastrophic fire exists.

The majority of this zone is within the department's 4-minute response time. However, two areas Campanil Hill and the upper part of Sea Ranch Road are outside the department's 4-minute response time.

Like the other three zones, the department has the same number of engines available to respond and would rely heavily on the cooperating fire agencies and aerial fire suppression resources for fire protection support. This zone has no volunteer fire department.

Fire behavior in this zone would be moderate for the majority of the year, due mainly to the ocean influence. Fires in this zone would be mainly slope and fuel driven fires within the pockets of open space that exist in this area. Fires would typically have short burning periods no longer than 1 day. During hot dry wind conditions, winds are funneled through the canyons in this zone, but not with the same intensity as canyons in the foothill high fire hazard zones. Under high fire danger weather or a down canyon wind condition, fire behavior in this zone would be moderate. No history of large fire occurrence has been found in this zone. Fire behavior predictions completed for this zone (See Appendix D) for a 10 mile per hour on shore wind, on a 30 percent slope, covered with moderate to light fuels, indicate the fire would consume 1 acre within the first 6 minutes and 2 acres within 12 minutes. Under a down canyon wind condition of 30 miles per hour, on a 30 percent slope, covered with moderate to light fuels, fire behavior predictions indicate the fire would consume 12 acres within the first 6 minutes and 48 acres within 12 minutes.

Staging areas within this zone are Arroyo Burro Beach overflow lot, Las Positas Park, along Cliff Drive, Santa Barbara City College, Vic Trace Reservoir, Shoreline Community Church (935 San Andres St.), Business Park at 800 Miramonte Drive, La Cumbre Junior High, and Earl Warren Showgrounds (large scale staging area).

3.1.4 Coastal Interior Zone

The Coastal Interior Zone has a mix of moderate brush, pockets of heavy canopy fuels, and landscape vegetation. Slopes range from 10 to 35 percent with a range of aspects. The ocean influence dominates the weather pattern in this zone for most of the year. Still, under down canyon wind conditions, the potential for a catastrophic fire exists.

The majority of this area is within the department's 4-minute response time, except for the Sea Ranch and Campanil Road areas.

Like the other two zones, the department has the same number of engines available to respond and would rely heavily on the cooperating fire agencies and aerial fire suppression resources for fire protection support. This zone has no volunteer fire department.

Fire behavior in this zone would be moderate for the majority of the year, due mainly to the ocean influence. Fires in this zone would be mainly slope and fuel driven fires and would typically have short burning periods no longer than 1 day. Under high fire danger weather or a down canyon wind condition, fire behavior in this zone would be high. The 1990 Paint Fire burned within 1 mile of this zone and stopped only because the down canyon wind pattern changed to an on shore flow. Fire behavior predictions completed for this zone (See Appendix D) for a 10 mile per hour on shore wind, on a 30 percent slope, covered with moderate to light fuels, indicate the fire would consume 1 acre within the first 6 minutes and 2 acres within 12 minutes. Under a down canyon wind condition of 30 miles per hour, on a 30 percent slope, covered with moderate to light fuels, fire behavior predictions indicate the fire would consume 12 acres within the first 6 minutes and 48 acres within 12 minutes. Spotting in this zone would be up to a ½ mile ahead of the fire.

Staging areas used for fires within this zone area Arroyo Burro Beach overflow lot, Las Positas Park, La Cumbre Junior High, and Earl Warren Showgrounds (large scale staging area).

Chapter 4 - Goals, Policies, and Actions

4.0 Goals

The goal of the Wildland Fire Plan is to develop a comprehensive, coordinated Wildland Fire Program to protect lives, property, and natural resources threatened by wildland fire. The Fire Department recognizes the catastrophic impact of wildfire in our community and is committed to reducing hazards and risk through fire protection, fuel hazard reduction, public education, preparedness, and community involvement.

Policies and actions outlined in this chapter are a combination of policies and actions the City has already implemented and what is proposed to be implemented. The actions listed below are separated into Existing and Proposed actions.

4.1 Policies and Actions

Codes and Standards

Policy 1 Classify the City high fire hazard area based on hazard and risk as identified by the City Wildland Fire Plan.

Proposed

Action 1.1 Update the Fire Department high fire hazard area maps to designate four high fire hazard zones – Extreme Foothill, Foothill, Coastal, and Coastal Interior within the high fire hazard area (See Figure 19).

Action 1.2 Apply appropriate mitigation and development standards to each of the four high fire hazard zones.

Action 1.3 Update the Fire Department high fire hazard area maps to designate the Hidden Valley annexation area into the high fire hazard Coastal Zone (See Figure 19).

Action 1.4 Update the Fire Department high fire hazard area maps to designate the Bel Air Knolls and Las Positas Park area along the east side of Las Positas Road into the high fire hazard Coastal Interior Zone (See Figure 19).

Action 1.5 Adopt language to the UFC, Appendix IIA outlining the authority of the Fire Chief to maintain the boundaries of the high fire hazard area. See Appendix E for adoption language.

Action 1.6 Adopt the following defensible space standards to all structures within each high fire hazard zone as follows (See Appendix E for adoption language):

Coastal Interior	30 to 50 feet defensible space
Coastal	50 to 70 feet defensible space
Foothill	100 feet defensible space
Extreme Foothill	150 feet defensible space

** Within any high fire hazard zone additional defensible space may be required on slopes greater than 30%. Slopes ranging between 30 and 40 % slope may require 200 feet defensible space. Slopes ranging from 41 to 60% may require 250 to 300 foot defensible space.**

Policy 2 Increase the survivability of homes in the high fire hazard area through the adoption of fire safe building codes.

Existing

Action 2.1 Monitor changes in fire and building codes. Modify and adopt codes as needed.

Policy 3 Increase the survivability of homes in the high fire hazard area through the adoption of defensible space standards and landscape guidelines on new, remodeled and existing homes.

Proposed

Action 3.1 Adopt the following defensible space standards around all structures within each high fire hazard zone (See Appendix E for adoption language):

Coastal Interior	30 to 50 feet defensible space
Coastal	50 to 70 feet defensible space
Foothill	100 feet defensible space
Extreme Foothill	150 feet defensible space

** Within any high fire hazard zone additional defensible space may be required on slopes greater than 30%. Slopes ranging between 30 and 40 % slope may require 200 feet defensible space. Slopes ranging from 41 to 60% may require 250 to 300 foot defensible space.**

Action 3.2 Rename the existing "High Fire Hazard Area Brush Clearance Requirements" to "High Fire Hazard Defensible Space Requirements". Revise the "High Fire Hazard Defensible Space Requirements" to reflect defensible space standards as outlined in Action 3.1.

Action 3.3 Revise the Fire Department "High Fire Hazard Landscape Guidelines and Defensible Space Requirements" handouts to reflect defensible space standards for the four high fire hazard zones. Work with City departments to include specific direction for property owners to reduce fire hazard and provide for protection of creek habitats and soil stability.

Action 3.4 Revise the Fire Department "High Fire Hazard Landscape Guidelines" to include minimum setbacks of plantings along driveways and roadways to meet Fire Department requirements.

Action 3.5 Revise the Fire Department "High Fire Hazard Landscape Guidelines" to incorporate tree planting guidelines under power lines as recommended by Southern California Edison.

Action 3.6 Require additions or remodels of existing residential properties in the high fire hazard area to comply with the Fire Department "High Fire Hazard Landscape Guidelines and Defensible Space Requirements".

Action 3.7 Include a copy of the "High Fire Hazard Defensible Space Requirements" as part of the disclosure report on zoning reports in the high fire hazard area.

Policy 4 Create a defensible community by increasing the number of homes that comply with the Fire Department "High Fire Hazard Defensible Space Requirements".

Proposed

Action 4.1 Complete a survey of all homes in the high fire hazard area to determine the percentage of homes that comply with the Fire Department "High Fire Hazard Defensible Space Requirements".

Action 4.2 Develop an enforcement program to enforce "High Fire Hazard Defensible Space Requirements" on undeveloped and developed properties within the high fire hazard area.

Action 4.3 Adopt an enforcement program for "High Fire Hazard Defensible Space Requirements" on undeveloped and developed properties within the high fire hazard area.

Action 4.4 Develop ways to allow the Fire Department to work with insurance companies and private landowners in reducing fire hazard on individual properties and within neighborhoods.

Funding

Policy 5 Develop funding sources and incentive programs for residents of the high fire hazard area to encourage reduction of wildfire hazards and risks.

Existing

Action 5.1 Research grant funding opportunities for wildland fire projects and apply for appropriate grants.

Action 5.2 Continue work to support and develop funding sources for projects with the Parks and Recreation and Public Works, Water Resources Division that reduce the fire hazard in high fire hazard and non-high fire hazard areas.

Proposed

Action 5.3 Develop a Fire Department position focused on grant research, writing, and administration.

Action 5.4 Research the feasibility of developing a high fire hazard area assessment district to fund wildland fire programs and projects.

Action 5.5 Develop a permit fee schedule for zoning report inspections, plan review, Pre-application Review Team, and Development Application Review Team submittals reviewed for high fire hazard area requirements.

Fire Rehabilitation

Policy 6 Post fire rehabilitation guidelines should be established for the City.

Proposed

Action 6.1 Develop appropriate post fire rehabilitation guidelines for property owners that address post fire effects of flooding and soil erosion.

Action 6.2 Develop a public education pamphlet on post fire rehabilitation guidelines.

Action 6.3 Ensure that post-fire rehabilitation guidelines are developed in cooperation with Santa Barbara County Flood Control.

Evacuation

Policy 7 Increase evacuation safety for residents and the general public in the high fire hazard area.

Existing

Action 7.1 Continue educational campaign to make residents, businesses, schools, and the public aware of evacuation planning and hazards.

Action 7.2 Continue educational campaign with homeowners associations and neighborhoods on the Red Flag Fire Alert Plan.

Action 7.3 Continue fire department vegetation road clearance along primary response routes in the high fire hazard area on a four year maintenance schedule to decrease vegetation obstructions.

Proposed

Action 7.4 Investigate signing of evacuation routes along high fire hazard roadways.

Action 7.5 Work with the Mountain Drive Volunteer Fire Department on notification and preparedness for wildfire and Red Flag Fire Alerts.

Action 7.6 Develop training bulletins for Police Department employees identifying recommended evacuation routes and proposed traffic control points. The Police staff in cooperation with the Fire staff would accomplish this action.

Action 7.7 Develop a simple, straight forward directive for the use of Police Watch Commanders and Field Supervisors identifying the duties and responsibilities of officers in the event of a major fire. This would be accomplished by Police staff in cooperation with Fire staff.

Action 7.8 Identify specific roads that do not meet Fire Department Access Standards and develop feasible mitigations and/or appropriate tools (exp. a tool box of measures) that can be used to reduce fire risk in these areas.

Fire Protection

Policy 8 Reduce fire engine response times in all high fire hazard areas to 4 minutes.

Existing

Action 8.1 Continue fire department vegetation road clearance along primary response routes in the high fire hazard area on a four year maintenance schedule to decrease vegetation obstructions.

Proposed

Action 8.2 Evaluate fire department response times for the high fire hazard area.

Action 8.3 Develop appropriate actions (development standards, vegetation management, signing, etc.) from evaluation of fire department response times.

Policy 9 Provide the highest level of fire protection services to the firefighters and residents within the high fire hazard area.

Existing

Action 9.1 Conduct department training classes focused on Urban Wildland Operations for all operations staff levels.

Action 9.2 Investigate all available alternatives to extend the City water supply lines along West Mountain Drive to all areas within the Extreme Foothill Zone.

Proposed

Action 9.3 Develop, fund and implement a high fire hazard enforcement program to ensure annual "High Fire Hazard Defensible Space Requirements" are met to increase firefighter safety.

Action 9.4 Increase the amount of interagency wildland fire training to gain expertise in wildland fire equipment.

Action 9.5 Fund and complete a wildland fire pre-attack mapping project to identify staging areas and safety zones and preplan high fire hazard areas using Geographic Information Systems.

Action 9.6 Incorporate identified staging areas and safety zones from Action 9.5 into the permit review process for all large developments in the high fire hazard area.

Action 9.7 Purchase one additional Type 3, wildland fire engine for wildland fire response.

Action 9.8 Purchase a Remote Automatic Weather Station (RAWS) in cooperation with local fire agencies to monitor fire weather and get more accurate fire weather forecasts for the community.

Action 9.9 Purchase three 1,000 gallon water fold-a-tanks to support water operations in designated Staging Areas during wildland fire incidents.

Action 9.10 Purchase 3 portable pumps to increase potential use of water supply from pools and ponds in the high fire hazard area. Standard complement for the Type 3 engines should include 1 portable pump.

Action 9.11 Work with the Mountain Drive Volunteer Fire Department within the Extreme High Fire Hazard Zone.

Action 9.12 Purchase two compressed air slip on units to utilize on department patrol vehicles.

Action 9.13 Identify potential fire fighting safety zones and escape routes within all high fire hazard zones. The importance of identified safety zone is critical to fire fighter safety.

Action 9.14 Develop appropriate improvements needed to make identified safety zones useable for fire suppression operations.

Vegetation (Fuels) Management

Policy 10 **Provide community protection from wildland fire through fuels management projects on City owned lands both within and outside the high fire hazard area.**

Proposed

Action 10.1 Incorporate the City 1993 Vegetative Fuels Management Plan into the Wildland Fire Plan (*See Appendix C and E*) .

Action 10.2 Update the 1993 Vegetative Fuels Management Plan to include vegetation management on city lands adjacent to private structures to ensure defensible space requirements (*See Appendix E*).

Action 10.3 Develop a creek vegetation restoration/maintenance plan that balances riparian values and fire hazard and risk on public lands.

Action 10.4 Identify any additional City properties not identified in the 1993 Vegetative Fuels Management Plan in non-high fire hazard areas, develop vegetation management projects for these areas to reduce the fire hazard and include in the Wildland Fire Plan (***See Appendix E***).

Action 10.5 Develop language for Conditions of Approval on new developments adjacent to City owned lands. These conditions will ensure that structures have either adequate setback to meet defensible space requirements on their property or that they will be held responsible for completing defensible space requirements on City lands as approved by the Fire Department and Park and Recreation or Water Resource Department as appropriate

Policy 11 **Support collaborative fuels management projects between the City and residents of the high fire hazard area to encourage fire hazard reduction and protection of natural resources. This includes compliance with Fire Department "High Fire Hazard Defensible Space Requirements", as well as additional defensible space projects requested by homeowners.**

Proposed

Action 11.1 Develop affordable incentive programs to allow homeowners to maintain defensible space around homes.

Action 11.2 Develop a creek vegetation restoration/maintenance plan that balances riparian values and fire hazard and risk on private lands.

Action 11.3 Work with the Mountain Drive Volunteer Fire Department on cooperative fuel management projects.

Action 11.4 Work with City departments in the development of Fire Department "High Fire Hazard Defensible Space Requirements" to ensure that fuels management projects on private lands decrease fire hazard and balance natural resource values.

Policy 12 Create a community fuels treatment network within the Extreme Foothill Zone to provide a fire buffer between continuous stands of chaparral fuel adjacent to the City boundary and more densely populated areas within the City. To be effective this project should be a collaborative project between County, City, and Montecito Fire Protection District.

Proposed

Action 12.1 Create a community fuels treatment network within the Extreme Foothill Zone. A community fuels treatment network is an area where multiple property owners interlink their individual defensible space zones and treat continuous strips of hazardous vegetation to form a vegetation management network to reduce fire hazard. See Appendix E – Vegetation Management for specific details on proposed implementation. And Appendix E – Glossary for definitions of terms used in this action item.

Action 12.2 Develop an Invasive Exotic Plant Management Plan to eradicate and eliminate the potential expansion of exotic pest plants within the Community Fuels Treatment Network.

Policy 13 Identify and prioritize vegetation management projects on private lands in the Wildland Fire Plan to reduce fire hazard.

Proposed

Action 13.1 Recognize the following vegetation management areas, called Vegetation Management Units, as identified by the Fire Department. Each unit is listed in the order of priority based on fire hazard and risk.

Extreme Foothill Zone

1. Las Canoas Road
2. Upper Coyote Road

Foothill Zone

1. Circle Drive/Las Barrancas
2. Coyote Road
3. Coyote Circle
4. Conejo Road
5. Fire Station 7
6. San Roque Creek
7. Hillcrest Road
8. Eucalyptus Hill Road
9. Alston Place
10. Owens Road
11. Cleveland School area
12. Jimeno/Garcia Road
13. Stevens Park area
14. Mountain/Las Tunas
15. Camino Viejo
16. Cima Linda
17. Alturas Del Sol
18. Garcia/Ferrello Canyon

Coastal Zone – no Vegetation Management Units
Coastal Interior Zone

1. Hondo Valley
2. Las Positas Road
3. Flora Vista

Action 13.2 Complete public education outreach within each Vegetation Management Unit. This initial outreach effort should address defensible space, fire access, building construction, public safety, resident addressing, evacuation, and Red Flag Fire Alert.

Action 13.3 Conduct a follow up meeting within each Vegetation Management Unit to help the neighborhood or community develop a vegetation (addresses fuels management and defensible space) and fire (addresses fire access, water supply, addressing, evacuation, etc) management plan.

Action 13.4 Develop funding sources to implement vegetation and fire management plans within the identified Vegetation Management Units. Funding sources could include grants, private landowner funding, City general fund, cooperative funds, etc.

Action 13.5 Develop project standards for each Vegetation Management Unit based on vegetation type, slope, aspect, biological concerns, and erosion potential. See Appendix E – Vegetation Management for specific details on vegetation management standards to be implemented for Vegetation Management Units. Reference Appendix F – Glossary for definitions of terms used in this action item.

Action 13.6 Develop an Invasive Exotic Plant Management Plan to eradicate and eliminate the potential expansion of exotic pest plants within any proposed project areas.

Action 13.7 Work with the Parks and Recreation, Creeks Division to develop vegetation management techniques that reduce fire hazard in creek areas and maintain creek values.

Policy 14 Look at creating economic alternatives and incentives for local businesses for the use of biomass generated from vegetation management projects.

Proposed

Action 14.1 Complete a feasibility study to look at creating economic alternatives and incentives for local businesses for the use of biomass generated from vegetation management projects in the CEQA environmental review document.

Public Education

Policy 15 Increase the community's knowledge and awareness of wildland fire and develop training and education programs to prepare, motivate, and educate the community.

Existing

Action 15.1 Research grant funding opportunities for wildland fire public education and apply for appropriate grants.

Action 15.2 Continue to work with businesses, schools, and assembly occupancies in the high fire hazard area to develop evacuation preplans and preparedness for wildfire.

Action 15.3 Continue to work with the Santa Barbara Fire Safe Council on public education projects to increase wildland fire public awareness and preparedness.

Action 15.4 Work with communities, neighborhoods, and individuals to get the message across that reducing the wildland fire threat requires them to take personal responsibility for preparedness, evacuation, brush clearance around homes, driveways, and roadways, and community cooperation.

Proposed

Action 15.5 Develop a fire landscaping brochure with all City departments to educate the public on fire safe landscaping, power line hazards, and wildland fire safety. The brochure should include fire safe landscaping, native landscaping, water conservation, soil stabilization, creek restoration, and non-invasive plant species concerns.

Action 15.6 Complete a standard public education package to disseminate evacuation preparedness, preplanning, and evacuation procedures to the public.

Action 15.7 Hire a professional media firm to develop a video specific to the Santa Barbara area on wildland fire. The video should include defensible space, fire landscaping, road access, Red Flag Fire Alert, resource concerns, and evacuation.

Action 15.8 Develop a program similar to Citizens Emergency Response (CERT) focused on wildland fire for residents in the high fire hazard area.

Action 15.9 Post fire danger signs in strategic areas within the high fire hazard area to notify the public of low, moderate, high, and extreme fire weather conditions. Signs would be designed to select the appropriate fire danger conditions based on National Fire Danger Rating System forecasts. The Fire Department will

work with community organizations to monitor and change weather conditions daily.

Action 15.10 Develop in cooperation with all City departments a detailed pamphlet encouraging property owners to maintain and/or create native landscapes within the high fire hazard area that meets High Fire Hazard Defensible Space Requirements.

Action 15.11 Develop educational material for the public to eradicate and reduce the potential for the expansion of exotic pests plants that has the potential to occur from defensible space projects.

Action 15.12 Involve Creeks Advisory Committee and Creeks Division in public education events related to vegetation management in the high fire hazard area.

Action 15.13 Develop public information for property owners on to eradicate and eliminate the expansion of invasive exotic plants within their defensible space. Incorporate this information into high fire hazard defensible space requirements.

Policy 16 Work with all City departments and staff to increase their knowledge, awareness, prevention, and preparedness for wildland fire.

Existing

Action 16.1 Continue to work with the Planning Commission and Architectural Board of Review to ensure a clear understanding of landscape design, defensible space requirements and vegetation management issues related to visual impacts.

Proposed

Action 16.2 Develop annual City staff training on wildland fire safety to train City staff working in the high fire hazard area. Training should include Red Flag Fire Alert, process for fire complaints, fire reporting procedures, and fire prevention, and defensible space requirements.

Policy 17 Work cooperatively with Federal, State, and Local jurisdictions to provide the highest level of fire protection, prevention and mitigation projects and programs in the county's urban wildland interface areas.

Existing

Action 17.1 Continue to work with cooperating agencies on suppression, training, prevention, evacuation, and public education in the high fire hazard area that benefit the entire community.

Action 17.2 Support collaborative vegetation management projects between the City and surrounding jurisdictions that reduce fire hazard and protect natural resources.

Proposed

Action 17.3 Ensure that the City and surrounding jurisdictions and agencies work cooperatively to address fire hazard and environmental impacts.

Action 17.4 Coordinate vegetation management actions where needed with Santa Barbara County Flood Control.

Figure 22

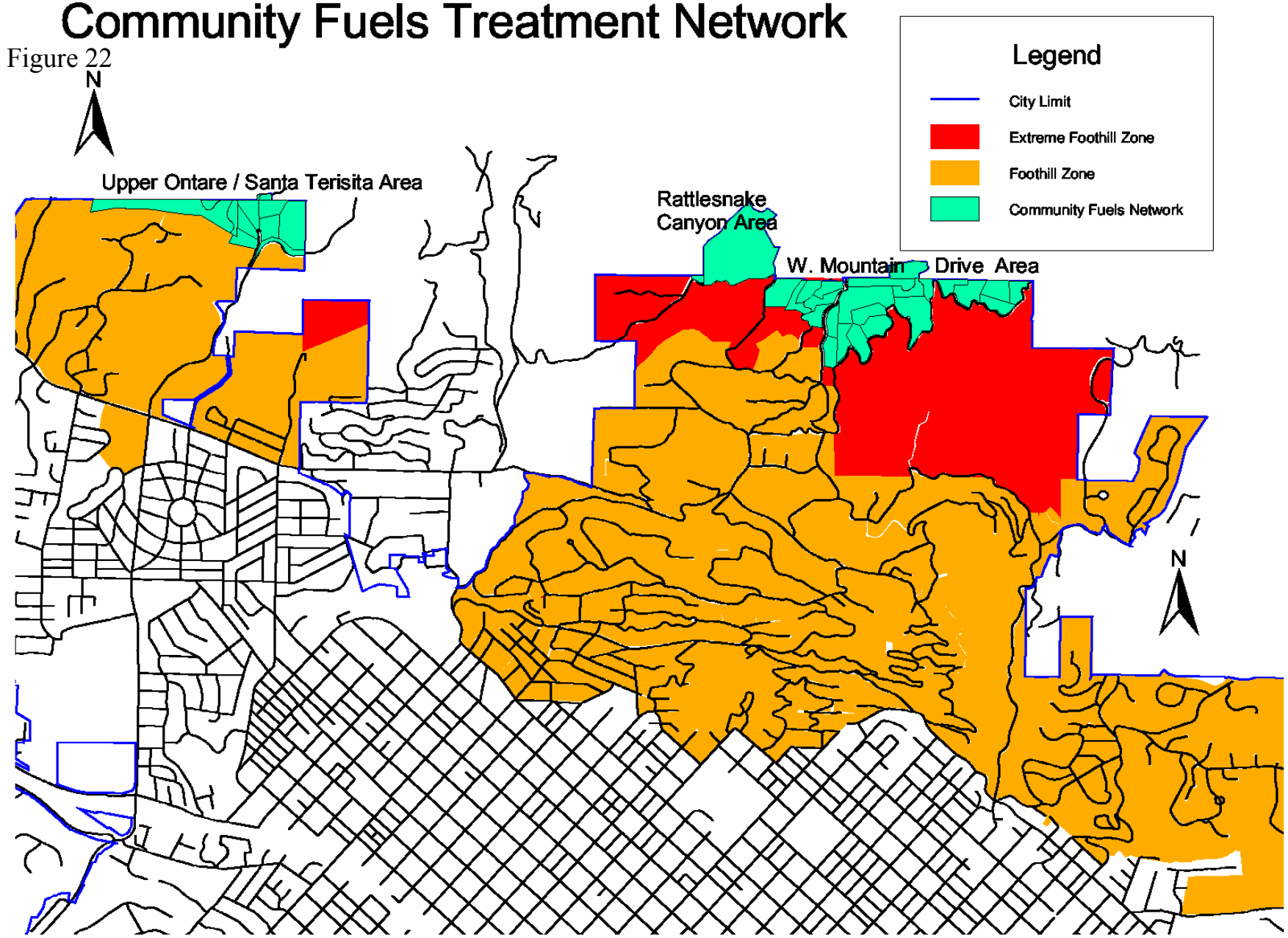
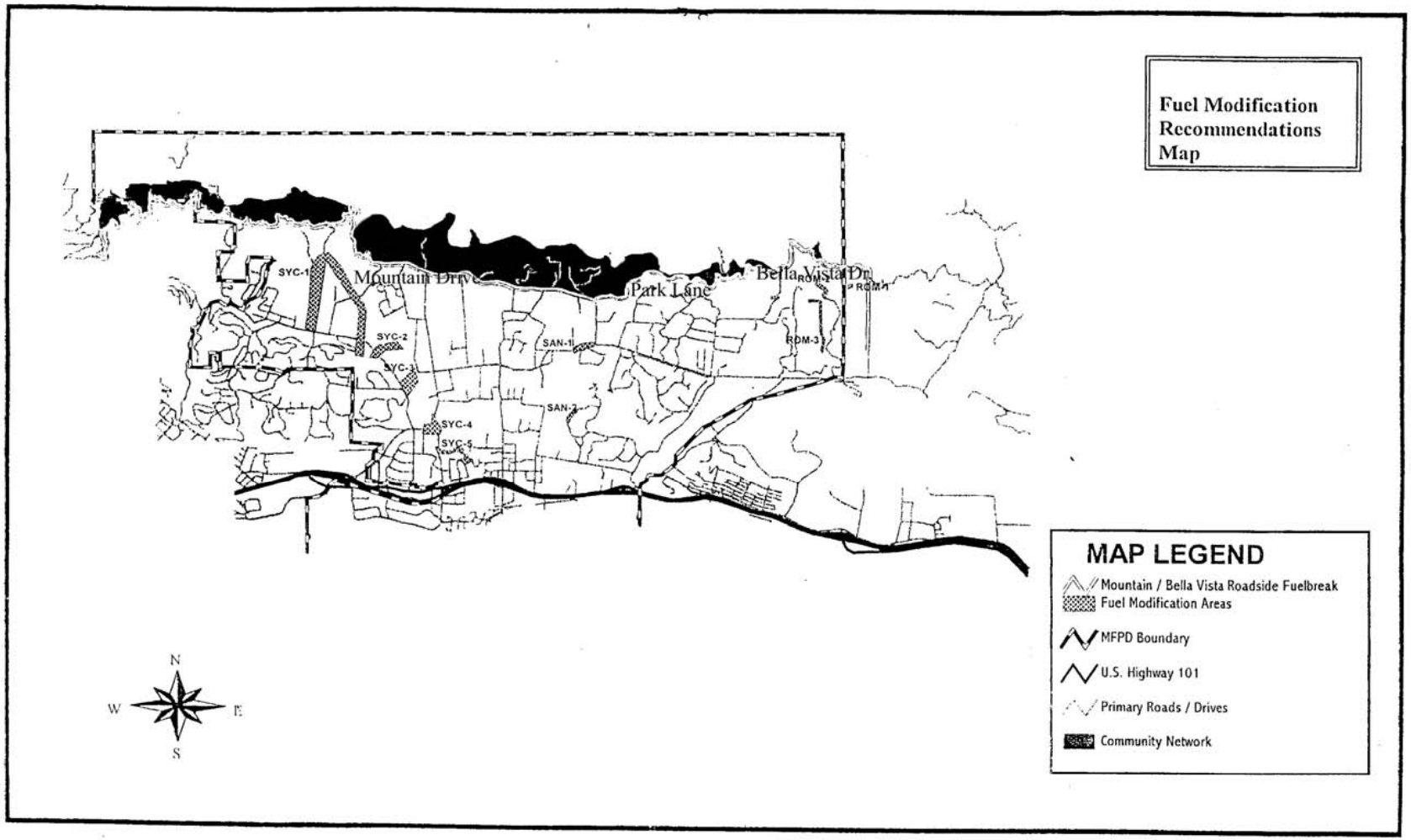

Community Fuels Treatment Network
Legend
City Limit
Extreme Foothill Zone
Foothill Zone
Community Fuels Network
N
Upper Ontare / Santa Terisita Area
Rattlesnake
Canyon Area
W. Mountain
Drive Area
N

Figure 23

Montecito Fire Protection District
Community Fuels Treatment Network



Chapter 5 Evacuation Procedures

Evacuation from a wildfire is the first and most important step the public can take in protecting themselves and their family. Evacuation during a wildfire is the primary responsibility of the Police Department and cooperating law enforcement agencies. Still, areas to evacuate and evacuation routes are typically determined from information received by the Fire Department units responding, based on fire behavior conditions and fire movement.

The City Fire, Police, and Public Works Department have worked with a County Pre-Fire Mitigation Task Force to address wildland fire evacuation planning. The task force also includes Santa Barbara County Fire, Sheriffs and Public Works Departments, Montecito Fire Protection District, Carpinteria/Summerland Fire Department, California Highway Patrol, California Department of Transportation, and various homeowners associations throughout the Santa Barbara area.

The work completed by this task force is the development of an evacuation preplan (Santa Barbara I-Zone Major Incident Preplan) that outlines Fire Department response routes, probable public evacuation routes, traffic control points, and staging areas. The interagency plan would be used by law enforcement, fire, and public works agencies during a wildfire evacuation. It can be used by agencies as an educational tool for the public. However, it must be noted that based on actual fire conditions occurring in the field, the preplans may be modified at the time of the incident. Therefore, it is stated that evacuation routes are probable evacuation routes.

The evacuation preplan separated the high fire hazard areas throughout the Santa Barbara front country into evacuation areas or “evacuation blocks”. Development of the evacuation blocks was determined by major canyons and road systems. Within the Santa Barbara City 26 blocks were identified (*See Figure 23).*

For each evacuation block a template and a map of the area were developed. The template outlined for each block the traffic closure points, fire response routes, fire resources that would respond to a fire based on first, second, and third alarm, probable evacuation routes, incident command posts to facilitate management of the fire, fire staging areas for fire equipment, collection points (evacuation centers) for civilians and animals, and any additional risk that exist with an evacuation block.

Within each evacuation block the road systems were evaluated to determine the best routes to use for fire response equipment and probable evacuation routes. Every effort was made to separate fire response routes and evacuation routes, however, in many evacuation blocks this was not possible because of the existing road system. Figure 24 shows Probable Public Evacuation Routes that may be used during a wildfire evacuation. Figure 25 shows Fire Response Routes that may be used by fire personnel.

In addition, the Santa Barbara I-Zone Major Incident Preplan identified traffic closure points, Incident Command Posts, Fire Staging Areas, and Collection Points based on their ability to adequately handle emergency response resources.

The document is in draft format as of this date. Areas within the Extreme Foothill and Foothill Zone have been completed and maps are being completed. The areas within the Coastal and Interior Coastal Zone still need to be developed.

A copy of the Santa Barbara I-Zone Major Incident Preplan is not included in this plan. A draft copy is available for public review at the Santa Barbara City Fire Department, Station 1, 121 W. Carrillo St. The Santa Barbara I-Zone Major Incident Preplan is a static document that will be reviewed as needed by Fire and Police Staff.

Figure 24

EVACUATION PREPLANNING
EVACUATION BLOCKS

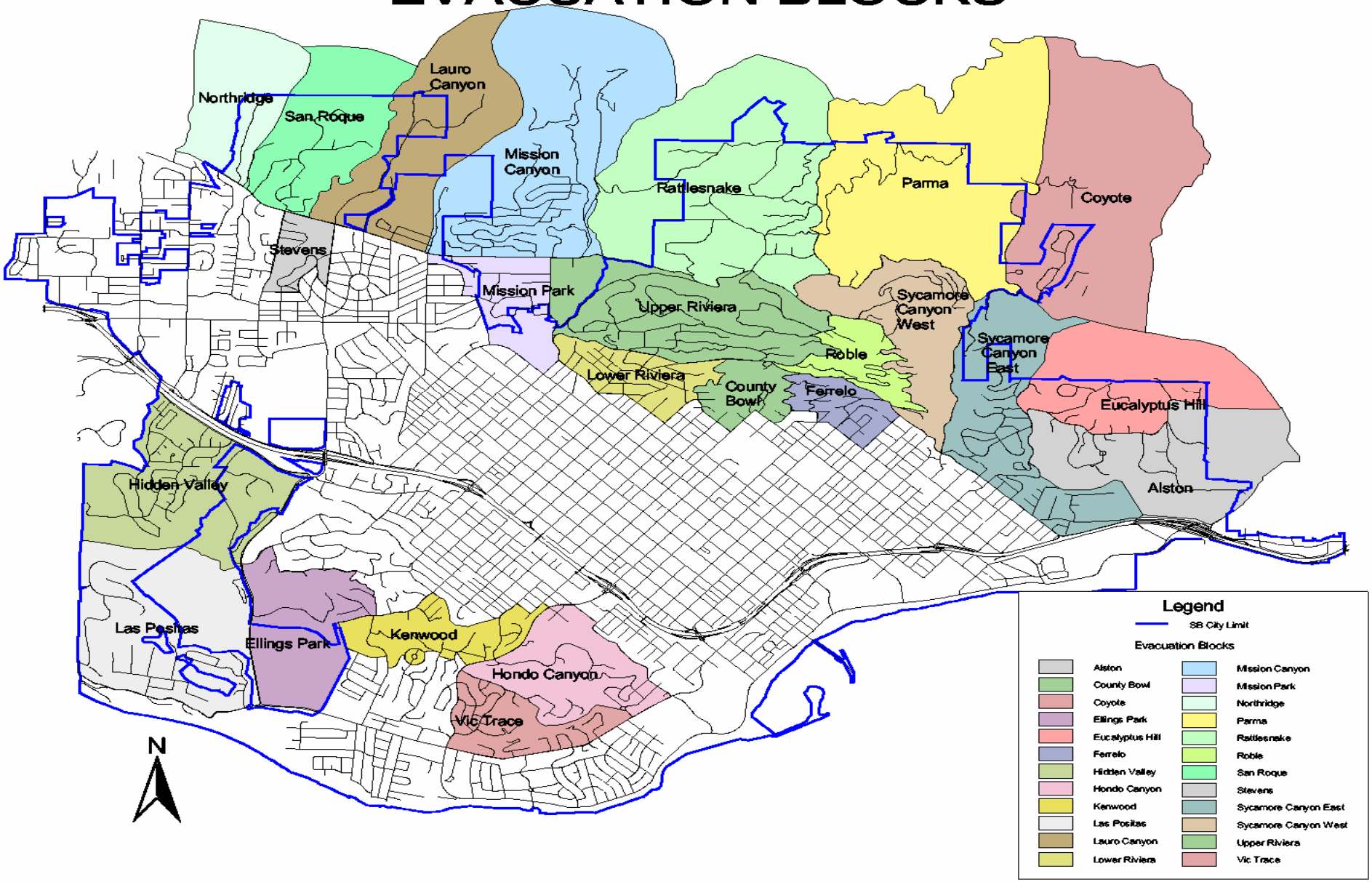


Figure 25 DRAFT - EVACUATION PREPLANNING
FIRE RESPONSE ROUTES

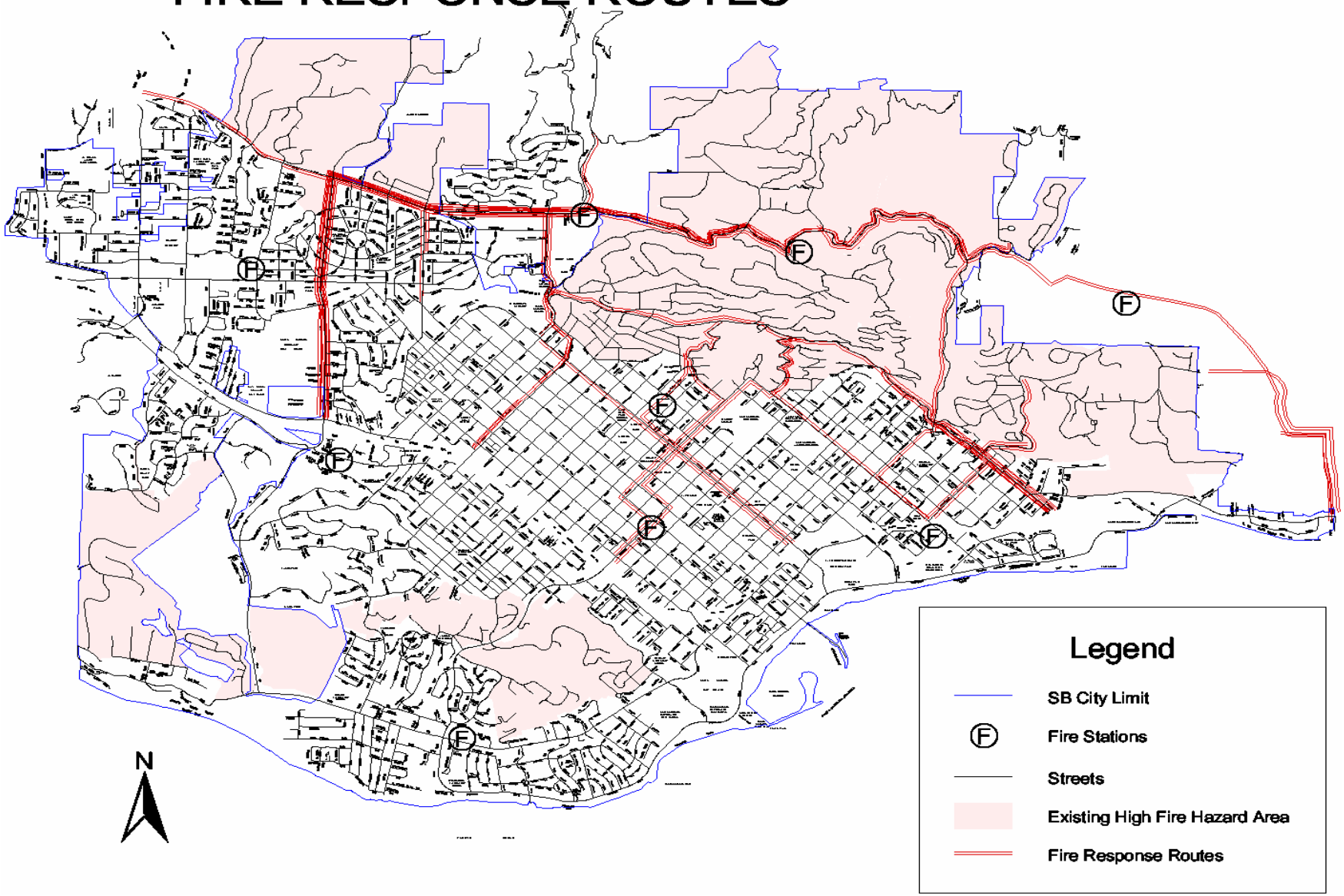


Figure 26

DRAFT - EVACUATION PREPLANNING
PROBABLE EVACUATION ROUTES